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ABSTRACT

Outcomes of the Junior Secondary Education Improvement Project (JSEIP), implemented in Botswana during 1985-91, are presented in this final report. The project's purpose was to help the Botswana government expand its 7-year basic education program (primary) to 9 years (primary and junior secondary). The first and second sections provide the context for the report, and the third section offers an overview of the project's purposes and goals. Section 4 describes how the project applies to Botswana's educational goals. Ways in which the instructional systems design (ISD) approach has been adapted to the country's educational context are examined in section 5. The sixth section summarizes change strategies that were used in syllabus and material development in each junior secondary subject area. The seventh and eighth sections document the development of the Ministry of Education in terms of curriculum development, teacher education, and advisors' area activities and products. The program's major accomplishments are summarized in section 9. Section 10 offers recommendations for sustaining and building upon project outcomes, particularly with regard to a potential 1992 Basic Education Consolidation project. Some of the lessons learned from the experience are reviewed in section 11. One table, two figures, and lists of JSEIP personnel, trainees, reports, and publications are included. (LMI)

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JSEIP

Junior Secondary Education Improvement Project

FINAL REPORT:
Project Summary
and
Lessons Learned

Submitted to
The United States Agency for International Development
and
The Florida State University

December 1991

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BOTSWANA

JUNIOR SECONDARY EDUCATION IMPROVEMENT PROJECT (JSEIP)

1985 - 1991

FINAL REPORT

Prepared by
Dr. Kent L. Noel
Chief of Party, JSEIP

December, 1991

JSEIP JUNIOR SECONDARY EDUCATION IMPROVEMENT PROJECT

Final Report: Project Summary and Lessons Learned — 1985 through 1991

Improving the Efficiency of Educational Systems Consortium and Associated Agencies

The Florida State University

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The Institute for International Research

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The State University of New York at Albany

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USAID/Botswana

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Botswana Ministry of Education

Contract No. DPE-5823-C-00
Order No. 3
Project No. 633-0229

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I feel fortunate to have been one of the first JSEIP advisors to have arrived to begin project in 1985 and to be one of the last ones to leave. I guess that means that I will be able to have the last word. And my last word is "Thanks."

- Thank you to the Government of Botswana for being the host of our project advisors and their families during the past six years.
- Thank you to the Ministry of Education: the Ministers, Permanent Secretaries, Deputy Permanent Secretaries, Chief Education Officers and their Departmental staffs.
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- Thank you to the United States Agency for International Development, especially the USAID/Botswana Directors, Deputy Directors, Human Resource Development Officers and many other technical support officers and staff.
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- Thank you to The Florida State University and the support staff at the Learning Systems Institute. Thank you to the rest of the IEES consortium including The Institute for International Research, The State University of New York at Albany, and Howard University.
- Thank you to the community junior secondary schools, their headmasters and headmistresses, teachers, and students.
- Thank you to the Colleges of Education and their staff.
- Thank you to the JSEIP team, the 16 long-term advisors and 35 short-term consultants, some who contributed early in the project and some who stayed after the project closed to complete reports and products which were contingent upon year-end examination results.
- Thank you to the PEIP Team for being here to help us out at the beginning of the project and working with us so well during the past six years.

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Kent Noel

I. INTRODUCTION

The Junior Secondary Education Improvement Project (JSEIP, Contract No. DPE-5823-3-00, Order No. 3, Project No. 633-0229) has completed its sixth and final year of work in Botswana. JSEIP's Eleventh and Final Progress Report, the last semi-annual report of the project, was produced and distributed to officials of the Ministry of Education, United States Agency for International Development (USAID), and the Florida State University (FSU) in December, 1991.

This JSEIP Final Report provides a summary of the major processes and products of the project over the last six years, highlights some of the lessons that have been learned during the course of this project, and suggests how future, large-scale education projects might gain from the JSEIP experience.

The purpose of this report is to provide information about the project in a single document for easy reference. Although the report provides some new information, much of its content has been drawn from previous project reports, evaluations, and JSEIP team members observations. Hopefully, readers engaged in education development work will find some aspect of the report useful in planning or implementing their projects.

The project was to have closed its doors in December, 1991. However, it was extended until April, 1992 by USAID/Botswana and the Government of Botswana to accommodate the need to create a "bridge" of activities between JSEIP and the next USAID/Botswana education project, the Basic Education Consolidation (BEC) Project which is due to commence in mid-1992. Therefore, the story of JSEIP has not quite been completed and the present tense narrative reflects this fact.

II. ORGANISATION OF THIS REPORT

This report is organised into twelve sections. The first and second sections provide a context for this report. The third section, drawn from JSEIP's Tenth Progress Report, provides an overview of the purposes and goals of the project. The fourth section, also adapted from the Tenth report, provides a description of how the project fits in to the educational goals of Botswana. The fifth section, drawn from the Ninth Report, provides a brief look at how the instructional systems design (ISD) approach has been adapted to Botswana's education context. The sixth section from the Ninth Report provides a summary of strategies for change used in syllabus and material development in each junior secondary subject area. The seventh section draws upon both the Ninth and Tenth Progress Reports and, from the perspectives of JSEIP advisors, documents the development and growth of the Ministry of Education in terms of curriculum development and teacher education. The eighth section summarizes the accomplishments and outputs of the project. The ninth section, drawn from JSEIP's Eleventh and Final Progress Report, provides recommendations for sustaining and building upon the achievements of the Ministry of Education during the project's tenure in Botswana, especially with the prospect of the new BEC Project occurring in 1992. The tenth section which incorporates information from JSEIP's Ninth Progress Report reviews some of the lessons learned from the JSEIP experience in Botswana. The eleventh section includes four sub-sections: (a) a list of JSEIP team members and consultants, (b) a list of the trainees who have received training under project sponsorship, (c) an author/title list of reports and publications that have been produced by the project, and (d) a list of final reports and products of JSEIP advisors

that have been submitted to USAID and the Institutional Contractor (FSU) as part of their contractual agreement.

III. OVERVIEW OF THE PROJECT

The Junior Secondary Education Improvement Project is a large-scale educational project which has been operating in Botswana from mid-1985 to the present. In 1984, the Government of Botswana and the United States Agency for International Development conducted an Education and Human Resources Sector Assessment. That assessment led to the design of JSEIP and the focus of the project. The project is funded under an umbrella project of USAID which is the Improving the Efficiency of Educational Systems (IEES) Project. The IEES Project was comprised of a consortium of organisations including The Institute for International Research, The State University of New York at Albany, and Howard University with the Florida State University as the primary contractor. (Howard University has since left the consortium.)

In general, the aim of the project has been to aid the Government of Botswana and its Ministry of Education in the expansion of a universal, seven-year basic education program (primary) to nine years of basic education (primary plus junior secondary). The project's focus has been on the revision of the junior secondary program. JSEIP has had two general purposes which are:

- To increase the quality and efficiency of the instructional component of Botswana's expanded basic educational system; and
- To institutionalize the capacity to develop, manage, and support the new junior secondary instructional component of the system.

The goals of the project include:

- the design, development, production, and implementation of curriculum materials for the junior secondary program,
- the creation of stronger linkages between curriculum reform and the preparation of new teachers and headmasters, and
- the enhancement of the junior secondary educational system in terms of quality of instruction and its planning, management and supervisory capacity.

With curriculum as its focus, JSEIP is to help establish the necessary requirements to sustain curriculum revision and innovation, foster the institutionalization of appropriate curriculum development protocols, and help put in place the support mechanisms (e.g., trained teachers and headmasters and a monitoring system) to maintain the dynamics of curriculum improvement beyond the life of the project.

IV. BOTSWANA'S EDUCATIONAL GOALS AS RELATED TO JSEIP

At Independence in 1966, only 2,416 Batswana held junior secondary certificates and no more than thirty-five people held university degrees. As late as 1971, only 13 per cent of the population were in school and only 32 per cent had had any formal education at all.

Since then, the Government of Botswana has placed a high priority on the improvement of education at all levels. An example of this is the dramatic expansion of education at the junior secondary level. That expansion began in 1983 in accordance with a plan proposed by the National Commission on Education in 1976-77 to provide greater and ultimately universal access to nine years of basic education for school-aged children in the country. At the time, there was already almost universal access to seven years of primary education. While the number of senior secondary schools increased from 22 to 23 between 1983 and 1989, the number of junior secondary schools increased from 20 in 1983 to 69 in 1988 to 98 in 1989 and to 146 at the present. Currently, the education system consists of 12 years of schooling with seven years at the primary level and two years at the junior secondary level (forming the Nine Year Basic Education Programme) and three years at the senior secondary level.

Until the 1980's, government-supported secondary schools had catered for both junior and senior secondary levels of education and the purpose of the junior secondary curriculum had been to lay a basic foundation for academic studies at senior secondary and university levels. Thus, the junior secondary program had been catering for the academic aspirations of about 20 per cent of the school-age population selected to continue schooling beyond junior secondary.

Since the advent of the Nine Year Basic Education Programme initiative, the goal of the government has been to provide all students with the opportunity to continue their formal education through the junior secondary level rather than primary level. As a result, the junior secondary program was to become more closely aligned and integrated with the primary program than previously. It was also to become less academic and more closely related to the practical realities of work and living in the "real" world. The National Assembly's *National Policy on Education* in 1977 summarizes the major aims of the new junior secondary program.

> The purpose of the schools at all levels will be to prepare children for useful, productive life in the real world. They should have the basic skills of literacy and numeracy and the knowledge that will make them self-reliant later in life, whether they continue full-time schooling, study on their own, find employment, or become self-employed (page 2).
>
> The goals of the intermediate level of education will be different from the aims of the present Junior Certificate. Whereas the present curriculum is academic, designed for a select few, and heavily oriented toward the Junior Certificate examination, the new curriculum will represent a continuation of the primary syllabus and curriculum. Its aims will be to provide all children with:
>
> (a) language tools needed in either further study or work;
>
> (b) a solid foundation in mathematics skills;
>
> (c) an understanding of scientific and technical subjects, based on examples in their own environment;
>
> (d) a sense of the nature of their society and their role in it;
>
> (e) an orientation toward further learning, whether formal or non-formal;

(f) an orientation toward work in the real world.

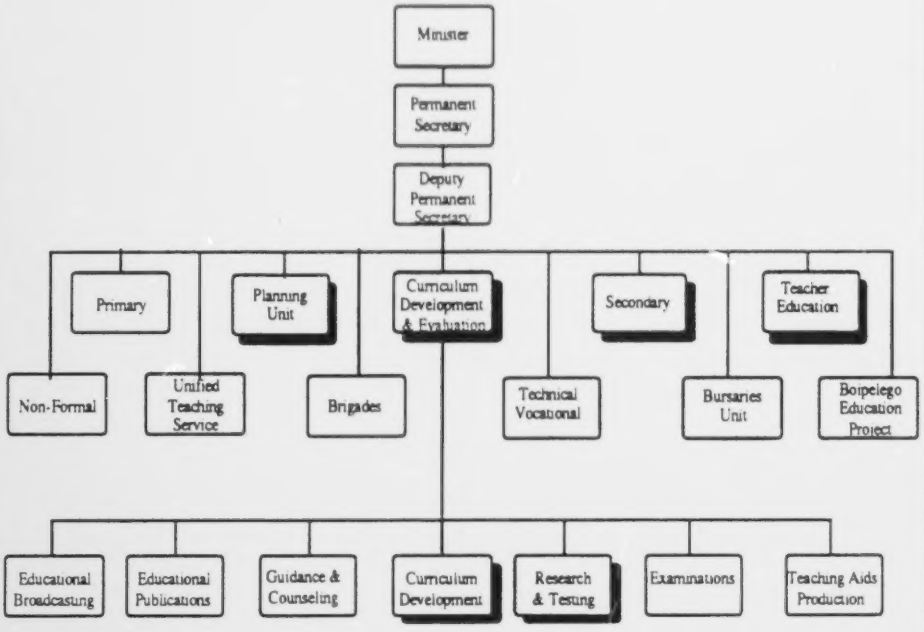
This change from the present type of Junior Certificate education does not mean a reduction in quality but rather a change in purpose. It is essential that the goals of the new schools be clearly understood (page 6).

By the start of the JSEI Project during the latter half of 1985, an increasing momentum toward the rapid increase in numbers of new junior secondary schools throughout the country was already underway. Concomitantly, the Ministry of Education had begun the massive undertaking of revising the curriculum at the junior secondary level to reflect the new goals of the Nine Year Basic Education Programme.

Figure 1 provides an overview of the Ministry of Education's organisational structure as it pertains to JSEIP. The "shadowed" boxes in the diagram indicate where JSEIP long-term advisors have been placed within the organisation.

Figure 1. The Structure of Botswana's Ministry of Education

Note: The shadowed boxes indicate departments or units with long-term JSEIP advisors.



The general purposes of the project to help the Ministry of Education accomplish its task incorporate the following specific purposes:

- Make the instructional component of junior secondary schooling more responsive to the training and employment context facing Botswana in the 1990s;
- Improve the instructional system, including
  - instructional design, curriculum development and testing,
  - coordination and focus of inservice training,

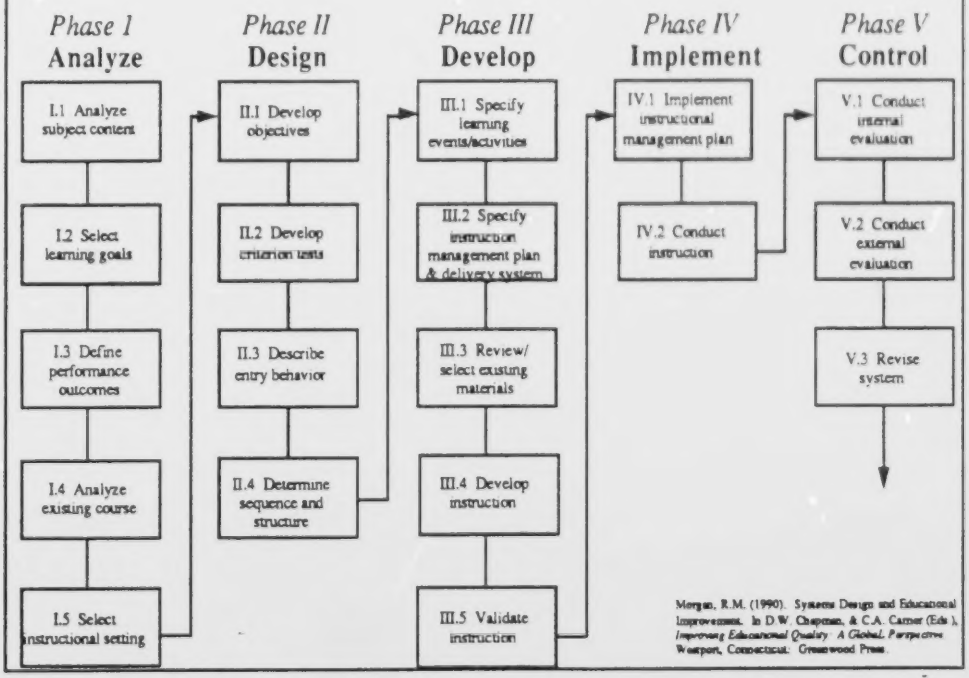
- design of selected aspects of the preservice educational program for junior secondary teacher candidates,
- linkage of curriculum development with teacher training,
- resource base for curriculum development,
- enhanced capacity for the quality of educational materials production,
- system development of research, testing and evaluation approaches;

- Train curriculum officers, school headmasters, inservice teaching staff, teacher trainers, guidance officers, and evaluation and testing officers for the system; and
- Provide an improved organizational communication and information architecture for the continued development of Botswana's Nine Year Basic Educational Programme.

V. ADAPTING AN INSTRUCTIONAL SYSTEMS DESIGN (ISD) APPROACH TO CURRICULUM DEVELOPMENT

An instructional systems design (ISD) model (Morgan, 1990, see Figure 2) was used in the basic design of the project. The experience of JSEIP provides an opportunity to study the use and implementation of an ISD approach within the practical setting of a progressive and rapidly growing educational system.

Figure 2. A Model for Instructional Systems Development



The general objective of this summary section is to identify the advantages and problems found in using a model of ISD within an education system which had been in existence for almost 20 years and which had not necessarily been following the theories and philosophies upon which ISD is based. The specific objectives of this section are to:

1. trace the implementation of an ISD approach in Botswana from its point of introduction through the JSEIP project in 1985 to its present status in 1990

2. to identify and explain some of the major contextual forces affecting the inputs, the processes, and the outcomes of the ISD approach

A. Perspective/Theoretical Framework

The application of instructional systems design has its roots in the development of individualized, self-paced learning, systematic management procedures, and the training (military and industrial) of personnel for specific jobs. As such, some of ISD's most enduring success stories are found within the context of the relatively closed training systems of business and industry. Within the context of public education, we deal with relatively open systems. In Botswana, although curriculum policy decisions are made centrally and most of the curricular materials are developed centrally, the responsibility for the development and implementation of curriculum is spread over a wide range of departments and individuals within those departments. Often, the progress of curriculum within a particular subject area depends on the experience, energy, sense of responsibility, and personality of a particular influential individual. Therefore, the ISD path followed within a public education setting may at times be far less direct and far more circuitous and convoluted than that found within a job training setting.

The use of ISD approaches in large-scale educational efforts in developing countries at the outset of the Botswana project was a relatively new phenomenon. As originally designed, the project provided ten advisors who were spread across most major parts of the educational system including curriculum development and evaluation, teacher preservice training, teacher inservice training, and headmaster inservice training.

Ideally, having advisors working with counterparts throughout the various areas of the Ministry of Education would facilitate communication within the Ministry and the implementation of the ISD process. Early in the project, it quickly became apparent that adjustments would have to be made to the original implementation plan and in the roles performed by the various advisors. First, the assumptions made in the original design of the project, in terms of both resources and infrastructure available, were not totally valid. For example, the curriculum development at the primary education level was largely incomplete. Additionally, there were too few qualified personnel to handle the responsibilities. Therefore, for the host country and the project to move toward the goals of developing curriculum for the junior secondary level, the Ministry of Education had to redirect its focus from the primary level to the junior secondary level. In the original design, each advisor was to have had a local counterpart to advise through which the implementation of his or her part of the program was to occur. These counterparts were not forthcoming until three or four years into the project. The majority of the curriculum development effort for the junior secondary schools was placed in a department (Secondary Department) other than the one identified as officially responsible for curriculum development (Curriculum Development and Evaluation). Therefore, three of the advisors who were charged with helping in the junior secondary curriculum effort were placed in a setting where, initially, there was no one to advise.

Obviously, in terms of the project and its goals of curriculum development, adjustments were required both within the project itself as well as at the educational systemic level (e.g., policy level which directed the over-all structure of curriculum development across subject areas) and some at the course and lesson level. These adjustments were often made on an ad *hoc* basis and frequently seemed at odds with an ISD vision of the project. The project was faced with the dilemma of trying to implement an ISD program within the context of a bureaucracy that was not operating

as a system. As a further stress to the introduction of the ISD model, the advisors did not hold the position of officers nor were they vested with the authority to decide what should be done, when, and to ensure that the decisions were carried out. While their advice was sought and considered, actions based on that advice were not always forthcoming. Finally, the status of curriculum development in specific subject areas was widely diverse. Some subjects had long been established and were not approachable in terms of curriculum change; other subjects had already charted a course of curriculum change, especially in materials, and were not amenable to suggestions from outside sources; still other subjects were in an embryonic stage although they had been charged with delivering curriculum materials to the schools within a very short time-frame.

In spite of the complexity of the situation, the theoretical framework of the ISD model has still had its useful applications. In retrospect, those components of ISD which achieved the greatest fruition in terms of curriculum development were those which directly addressed the perceived needs of various curriculum developers. Therefore, ISD was implemented most directly at the component and sub-component level rather that at an over-all systems level. To infuse ISD concepts into the development of curriculum, a micro-strategy or "opportunistic" strategy of systematic development evolved. The characteristics of that strategy included: (1) identifying the perceived needs of individual curriculum developers in addressing the curriculum development problems at hand; (2) helping them address those problems systematically, using relevant instructional design procedures; (3) capitalizing upon successes within one subject area by holding them up as good examples for other officers to use as potential models; (4) once success in using a particular strategy was achieved, establishing policy which ensured that future curriculum development efforts in all subject areas were conducted in the same relatively systematic fashion; and (5) using a lot of "revise as required" strategies in improving existing materials as more officers identified or were informed of curriculum needs that required attention.

B. Conclusions

While an ISD model used within the context of education in a developing country has its uses, its most successful applications seem to be at the component and sub-component level as opposed to an overall systems level. Many of the key players within an existing educational system do not share the vision of ISD, are not trained to use an ISD approach, are not willing to share power to make curriculum decisions, or simply do not have the time or resources to commit to the development of material through an instructional design approach. Under these circumstances, an "opportunistic" approach to ISD seems feasible. That is, the ISD approach, theoretically, is still a goal to strive for but it is most likely to be effected in bits and pieces in order to address the immediate needs of the local curriculum developers rather than as a whole. The result is that, at any given time, some elements of an ISD approach are found in most subject areas of the curriculum while other elements are rarely seen.

VI. INSTITUTIONAL DEVELOPMENT OF THE CURRICULUM DEVELOPMENT UNIT

During the last six years, the Curriculum Development Unit (CDU) has undergone significant and progressive change in terms of facilities, staffing, and professional growth. Increasing the efficiency and effectiveness of the processes for curriculum development has been a goal of the CDU since its inception; however, that goal would have been impossible to achieve without a comparable increase in the CDU's institutional capacity. This section briefly describes how the CDU's institutional capacity has grown since the advent of the Junior Secondary Education Improvement Project.

A. Background

Prior to the introduction of JSEIP, a number of important events had already occurred. The CDU was conceived as a result of the 1975-76 National Commission on Education which led to a *National Policy on Education* document. This new policy statement was approved by the National Assembly in 1977. The policy paper stated that "curriculum development will be led by a new Curriculum Development and Testing Unit," thereby establishing the Curriculum Development Unit.

The original goals for the CDU included:

- the coordination of the implementation of all curriculum development policies,
- the supervision of the formulation of educational goals,
- monitoring the revision of syllabuses,
- development of a production division for materials production, and
- the design, development, try-out, and evaluation of curricular materials.

Those goals remain much the same to this day.

Initially, the CDU existed in name only under the Chief Education Officer of the Department of Curriculum Development and Evaluation (CD&E). In addition to the CDU, the newly-formed department consisted of the Research and Testing Centre, the Teaching Aid Production Unit, Schools Broadcasting Unit, and Examinations Section. In 1978, the first professional officer of the CDU, a Senior Curriculum Evaluation Officer, was appointed. This post was filled by a USAID funded consultant, Dr. Easterly, from 1978 to 1980. He helped establish the early structure of the Curriculum Development Unit and, in particular, helped organize primary subject panels to aid in curriculum work. This component of the CDU still exists today. In 1980, the CDU staff was increased to three officers, including a Senior Curriculum Evaluation Officer and two Curriculum Development Officers.

B. Growth Since the Advent of JSEIP

By the time the first JSEIP technical advisor in curriculum arrived in November, 1985, the Unit was still quite small, consisting of six officers. Already, the first Chief Education Officer of the Department of Curriculum Development and Evaluation (CD&E), Mr. Jakes Swartland, had been promoted to Deputy Permanent Secretary of the Ministry of Education. His replacement was Mr. Hope Phillips, now working with the U.S. Peace Corps organization in Botswana. The Senior Curriculum Evaluation Officer who had replaced Dr. Easterly in 1980 was Mr. Philemon Ramatsui. Mr. Ramatsui was soon to be promoted to Principal Curriculum Development Officer and is now the current Chief Education Officer for the Department of CD&E. The five curriculum development officers included one in Mathematics, one in English, one in Setswana, and two in Science. The two Science officers were Dr. Jack Reed who held a USAID funded position and who joined the Primary Education Improvement Project

two years later and Felicity Leburu, now the CDU's Principal Curriculum Development Officer. Only two officers had formal training in curriculum development. Two of the six officers had been in their posts for less than eight months.

A major reason for initiating the JSEIP project was the Ministry of Education's decision to expand the seven year basic education program to a *Nine Year Basic Education Programme* beginning in 1986. Prior to 1986, the CDU had been responsible for the development of the primary curriculum. One of the officers had been a tutor recruited from a Primary Teacher Training College. All others had been recruited from secondary schools because of their excellence as teachers in their subject areas; however, they lacked experience teaching the primary school curricula. All junior secondary curriculum initiatives had been coordinated by Senior Education Officers of the Secondary Department, and CDU subject officers had very little, if any, responsibility for curriculum decisions made for that level.

The new nine year program necessitated changes in primary and junior secondary curricula as an integrated whole and a dramatic increase in the number of Community Junior Secondary Schools in Botswana. Therefore, from 1986 onwards, a gradual transition in the responsibilities of the Curriculum Development Unit took place. In addition to their primary curriculum activities, CDOs were now expected to address the needs of the junior secondary program as well as primary within the framework of the *Nine Year Basic Education Programme.*

To compensate for the desperate lack of staffing to handle its new responsibilities, the CDU initiated a stop-gap measure by seconding two teachers in each core subject area and one optional subject area to the CDU to help develop teaching and learning syllabuses and materials for the *Nine Year Basic Education Programme.* These personnel, along with Curriculum Development Officers and selected Secondary Senior Education Officers, became known as Material Development Teams (MDTs). The MDTs operated within the CDU from April, 1987 through 1989 and primarily developed syllabuses, schemes of work, teacher's guides, and modules for their subject areas at the junior secondary level.

During the early years of the JSEIP project (1985-86), the progress made toward the CDU's and JSEIP's institutional and curriculum goals seemed incredibly slow. However, looking back at the accomplishments that have occurred during the life of the project thus far, much progress has been achieved in a relatively short time of the unit's life. Currently, the Curriculum Development Unit has over twenty curriculum development officers, including four advisors provided through USAID/JSEIP funds. Whereas it had officers in only four subject areas in 1985, it now has officers representing ten areas: the core subjects of English, Mathematics, Setswana, Agriculture, Science, and Social Studies, as well as optional subjects of Art, Design and Technology, Religious Education, and Home Economics (to occur in 1990). Many of the more recently-appointed officers were formerly among the seconded teachers who were part of the Material Development Teams. Through the Kalahari Conservation Society, the CDU has one full-time person working in the area of Environmental Education. The Unit has not only a Principal Curriculum Development Officer but also three Senior CDOs. About half of the CDOs have Master's degrees and at least two more will have their Master's by the end of the JSEIP project in December, 1991. Additionally, in early 1990, the CDU added a curriculum planner, a curriculum evaluator, and a production officer to its staff.

Initially, the CDU was located in a building with a few typewriters and desks, one erratic copy machine, and a few cramped offices shared by two or three officers. The

building was so far removed from its sister units and other education departments that it was an event, and sometimes an ordeal, even to be able to communicate with them. In October, 1987, the CDU moved from that location to a building which comfortably houses not only the CDU but also the Research and Testing Centre, Guidance and Counselling, Curriculum Resource Centre, and Examinations Units and the numerous consultants who help with the development work from time to time. It has its own Production Division with state-of-the-art equipment and programs for desktop publishing. In addition, the CD&E Resource Centre is stocked with a growing number of reference materials which are useful in curriculum and evaluation work It has also turned into a valuable resource for University of Botswana students conducting research studies in education.

The CDU has evolved from a unit where many officers were unsure about how to write a performance objective to a staff which is now concerned with ensuring that the instructional objectives are relevant and appropriate to the needs of the country and are validly and reliably tested and evaluated. It has moved from a time when people waited a week or so for a document to be produced by the secretarial pool to a professional staff who have demanded and have received access to their own computers and who produce their own higher quality documents on laser printers. During the same period, the Department of Curriculum Development and Evaluation has grown into a sizable department which includes the Curriculum Development Unit, Examinations Unit, Guidance and Counselling Unit, Educational Publications Unit, Schools Broadcasting Unit, and Teaching Aids Production Unit. The organization of some of these units and the considerable growth within all of the units during the past few years are developments with which JSEIP has been proud to be associated.

VII. STRATEGIES USED IN CURRICULUM CHANGE

Upon the arrival of the JSEI Project in 1985, the Curriculum Development Unit officers had already recognized various curriculum needs within their specific subject areas, especially given the impending introduction of the *Nine Year Basic Education Programme* which subsequently took place in 1986. There was a need for syllabus revision to conform to the new program and the need to develop new teacher and student materials based on the new syllabuses. While the need for curriculum change was required at the primary level as well as the junior secondary level, JSEIP's focus was aimed at the junior secondary level only. To thoroughly understand the status of curriculum within each subject area in 1985, a case study approach to describing individual subject areas might be warranted. However, for the purposes of this discussion, the general 1985 status of each subject in practical terms can be summarized in the table below. The progress that has been made in the various subject areas in developing their junior secondary materials is charted on the next page.

Subject	Status of Junior Secondary Curriculum in 1985
Little or No Curriculum in 1985	
Art	The art curriculum had not been formalized. That is, no syllabus or materials had been developed to be used in all schools throughout the country.
Social Studies	While a topic outline had been developed for social studies, no objectives had been developed upon which a curriculum could be based. Also, there was only one small book of case studies for teachers to use with the new curriculum and it had been found inadequate by social studies teachers.
Decision to Revise Curriculum in 1985-86	
English Agriculture Setswana Design & Tech.	The decision was made to revise the syllabus to better address the needs of Batswana pupils. This also implied the need to ultimately develop completely new student and teacher materials.
Curriculum had already been undergoing revision in 1985	
Science	Science had been undergoing a gradual revision prior to 1985. Interim steps had already been taken to provide student materials for the new junior secondary program, primarily in the form of worksheets. Therefore, its strategy was to continue with the revision process, both in syllabus and materials.

At the outset of the JSEI Project, it's role in the whole curriculum development process was to help all subject areas to address their perceived needs. The degree to which JSEIP advisors were involved in each subject area depended on both the curriculum need within subject areas and the demand for or willingness to accept help on the part of those charged with curriculum responsibilities. While there was an awareness of how a systematic curriculum development process should work among some officers, there was far less awareness of how to implement curriculum development in a systematic fashion. Therefore, much of the support provided by JSEIP has been to increase the level of awareness and skills required for implementation of a systematic curriculum development effort. It also helped identify opportunities to make inroads for institutionalizing some of those design, development, and evaluation processes. Thus, much advisor time and consultant work was devoted to conducting workshops across the country on curriculum development for most of the subject areas, guiding individual officers in their attempt to design and develop materials, and evaluating

materials as they were being developed. Only now are the fruits of those development efforts being seen in terms of the processes being used in the various subject curriculum efforts. For example, all syllabuses with which JSEIP has been involved include objectives; continuous assessment is gradually being incorporated in the materials being developed; and attempts at formative evaluation of materials using experts and field testing are becoming part of the process. Also, the norm-referenced Junior Certificate Examinations are gradually being replaced by criterion-referenced exams. While these have not all been institutionalized, the groundwork has been laid and definite inroads have been made. By 1991, manuals and training materials on curriculum development for CDOs will have been developed for reference and training within the Curriculum Development Unit.

With the exception of syllabus development (in which the project was involved across subject areas), each subject's approach to the development of materials was based on it's individual status. Therefore, a brief discussion of the syllabus development strategies is presented below followed by a description of materials development by subject area.

Syllabus Development

Early in the project, the great need for more staff within the CDU to help with the enormous curriculum development effort was recognized by the MOE and JSEIP. JSEIP proposed and provided support for the secondment of two teachers for each core subject area to help with this effort. These teachers with CDOs and SEOs for each subject area formed Materials Development Teams (MDTs). Prior to 1985, most of the subject syllabuses had been used primarily as teaching syllabuses; they contained few performance objectives on which systematic development of materials and testing could be based. Therefore, the CDU with the help of JSEIP advisors conducted workshops for all MDTs and subject panels to address the need for objectives in their syllabuses. This formed the basis for later syllabus development in each subject area within the CDU.

Agriculture

- Syllabus

  While agriculture had been taught and examined at the junior secondary level, the *Nine Year Basic Education Programme* directed that the subject be taught at the primary level as well. As an interim strategy, agriculture decided to develop an interim syllabus for junior secondary. This interim syllabus was designed to address the immediate needs created by collapsing a three year junior secondary program into a two year program while initiating an effort to develop a primary curriculum which would ultimately be linked to the junior secondary syllabus.

- Materials

  Agriculture had been dissatisfied with the junior secondary materials being used in the classroom. Therefore, officers decided to develop interim teacher's guides and some student support material which would address the lack of adequate materials. Two JSEIP advisors and three short-term consultants helped in this effort. After that, agriculture turned its attention to developing primary curriculum materials. Agriculture will revisit the junior secondary curriculum when the primary curriculum has been adequately addressed.

Progress Chart: Junior Secondary Curriculum Development **

Shaded Areas = Progress To Date	Syllabus Revision			Student Materials							Teachers Guides	Supplementary Material	Inservice Training	Planning for	
Core Subjects	Planning	Working Draft	Approval	Unit. Object.	First Draft	Forma. Evalua.	Revision Done	Final Draft	At Publish.	In Schools				CRT Exam	Cont. Asses.
Agriculture (J.Chengeta)				Form 1							Interim 1990		As Needed		
				Form 2											
English (L.Scheffers)				Form 1									Ongoing		
				Form 2											
Setswana (N.Ratsoma, S.Mothei)				Form 1						1992	Interim		As Needed		
				Form 2							1989				
Science (S.Makgothi)				Form 1						1992	1992	Science Kits	Ongoing		
				Form 2						1993					
Social Studies (P. Richard, M. Masisi)				Form 1						1992	Interim 1988	Interim Modules Meth.Bk	As Needed		
				Form 2		1992				1993					
Mathematics (V. Mogegeh)	No CDU	Involvement		Form 1											
				Form 2											
Optional Subjects															
Art (CDO - soon to be appointed, L. Ives*)				Form 1						1992.	Teaching Syllabus & Guides	Visual-Aid Packets	Ongoing		
				Form 2						1992					
Design & Technology (T. Peloetswe, J. Robb*)				Form 1						58 in'92		Textbook Product. Ongoing			
				Form 2		1992				16 in '92					
Home Economics (To be appointed)				Form 1											
				Form 2											
Religious Education (S. Ramahobo)				Form 1											
				Form 2											
Non-Examined Subjects															
Music Education (No CDO)				Form 1											
				Form 2											
Physical Educa. (No CDO)				Form 1											
				Form 2											

Other CDU Officers:
PCDO (F. Leburu) **
Plng Off. (P. Moanakwena)
Eval. Off. (N. Koolese)
Plng/Eval. Adv. (K. Noel)

* **Long Term Advisors**
** **JSEIP Short-term Consultants:**
1. *Agriculture* - syll. plnng. (1)
2. *English* - student & tchr. mater. (1)
3. *Science* - syll., text design, forma. eval. (2)
4. *Social Studies* - tchr. guides, student & tchr mater. (4)
5. *Art* - syll., student & tchr. mater., tchr. training & art exhibitions (3)
6. *Design & Technology* - syll., student & tchr. mater. (2)
7. Criter. Ref. Tests (3)
8. Formative Eval. (2)
9. Curr. Developmt. (2)
10. Curr. Planning (1)

(revised 1 November, 1991)

Art

- Syllabus

The tremendous progress in this area involved both long and short term advisors supported by the project. Art is an examinable subject offered in many but not all junior secondary schools. Each year the program expands as trained Art teachers graduate from the Molepolole College of Education, a program initiated by the JSEIP curriculum advisor in Art. The *Junior Secondary Art Syllabus* for Units 1-5 (Unit 6 is review) of the new two-year program was distributed for trial in 1989, and of course, was a basis for the development of teacher training at MCE. By the end of 1991, the final syllabus and teaching notes were completed.

- Materials

The new curriculum and support material were introduced in 1989 and were tried out throughout the country. The materials have been evaluated and revised for publication for 1992. Characteristics of this curriculum are: emphasis on problem-solving situations; direct links to Botswana's manpower needs; utilization of local environment in activities and projects; and cost effectiveness. Dissemination of the new program was introduced through the *Art Mo Botswana* newsletter, organized and implemented through the Molepolole College of Education.

- Innovations

The entire art program is an innovative variant of the *discipline-based method* of art education. The *Junior Secondary Art Programme* has a balanced practical and theoretical basis that can help meet the needs of this growing economic sector in Botswana. Art education is intended to strengthen the problem solving and critical thinking abilities of students, enhance their appreciation of the environment, improve the quality of their adult lives, and guide their interests and skills towards opportunities for advanced training, employment, and self-fulfillment. Public sector employers and entrepreneurs are being informed about the Art education program, are becoming aware of the skills it develops, and how they can help to shape it further. This has been accomplished through an *Art Education and Art Employment Project*, sponsored by JSEIP, in which employers in the private and public sectors were interviewed to determine what types of art-related jobs exist, how many of those jobs exist at the various levels of employment, how employers find employees, how job-seekers find available employment, what sorts of non-formal or on-the-job training occurs, and what valid projections of art-related employment can be made. The needs and projections of art-related job opportunities are integrated into the *MCE Teacher Training Curriculum* and into the *Junior Secondary Art Program*. Additionally, JSEIP sponsored an *MCE Art Apprenticeship Program* where student teachers are placed for three-weeks with private sector employers or with self-employed entrepreneurs for work experience in art and craft related experiences between terms of study at MCE that program continues today with Ministry assuming the associated costs.

English

- Syllabus

English revised the existing syllabus to represent a more communicative approach to the teaching of English in the schools.

- Materials

Based on the syllabus, new materials, including a *Teacher's Handbook, Student's Book,* and *Workbook*, were developed for Forms 1 and 2. Extensive classroom

observation information, based on the national implementation, indicates that teachers are not implementing the program as planned and therefore, the overall effectiveness of the national implementation may be difficult to judge. Clearly this will be a problem for all innovative approaches to instructional improvement. Increased emphasis and attention must be given to implementation problems. Unfortunately, there is no organizational component that accepts responsibility for this task, so the problems are likely to continue.

- Innovations

The materials for English incorporated a communicative approach in the curriculum, not only trying to address the more practical skills required to function in English in Botswana but also trying to ensure that adequate oral practice, through group work, was part of the curriculum. English was the first subject to try to incorporate a systematic method of formative evaluation in their materials development effort. It was also the first subject to try to incorporate continuous assessment as a contributor toward the JC Examination mark. Because it was a pioneer in these and other approaches, it has provided many lessons for other subject areas as they go about the change process.

Setswana

- Syllabus

The subject of Setswana was not originally in the scope of work for JSEIP but JSEIP support for development of its curriculum was required nevertheless, initially in syllabus development and later in materials development.

- Materials

Based on Setswana's revised syllabus, the first step was to provide a scheme of work for teachers suggesting how the various objectives could be taught during the two year junior secondary program. Based on the scheme of work, interim teacher guides were developed to help support teachers. Currently, a student text for Form 1 has been developed and a draft copy of Form 2 text is under development. These should be in place in 1992/93.

- Innovations

A primary innovation within Setswana was the development of objectives for the subject. This act gave teachers a far greater understanding of what should be taught. A second innovation was a decision to focus less on the teaching of grammatical structures in Setswana and to focus more on the building of communication skills and an understanding of Batswana culture.

Social Studies

- Syllabus

Social Studies was in a state of turmoil in 1985 because, while it had been taught at the primary level, it was replacing the traditional teaching of separate subjects (geography and history) at the junior secondary level. Seemingly, overnight, teachers trained in either geography or history had been turned into "social studies teachers." During the early stages of this development effort, the JSEIP inservice advisor who had previously specialized in social studies development in Africa substantially helped reduce the anxiety among social studies teachers throughout Botswana by conducting, with the social studies panels, workshops for teachers. At those workshops teachers helped develop the syllabus content and prepared interim teachers guides which would help them teach their subject with the few teaching

resources available. JSEIP advisors then worked with the social studies MDT and panel to refine that syllabus.

- Materials

To more systematically address the crisis created by lack of materials for social studies teaching, a JSEIP short-term advisor with the two MDTs helped develop a teacher's guide and teaching modules, recognizing that, in the long term, more formal classroom materials would be required. These materials were distributed and regional inservice workshops for teachers were held to help teachers use the new materials. At a later point, a long term advisor in social studies was brought in to help with the development of a teacher's guide, student text, and student activity book. The student text and teacher's guide for Form 1 has been developed and Form 2 materials are underway. Finally, because the teaching of social studies is so dependent on appropriate teaching methodologies, the CDU through JSEIP invited a short term consultant to develop, with social studies educators throughout Botswana, a teaching methods book. The first published draft of that book was available in 1990 and the first official trial edition was published in 1991. It is in great demand by teachers and teacher training colleges.

- Innovations

Apart from the teaching methods book which is the first such book developed exclusively for Botswana, an innovative approach is being taken with the development of student materials. Recognizing the problems students have in comprehending English text, the student activity book is being developed to help students comprehend and practice the social studies concepts and skills being taught through the social studies materials.

Science

- Syllabus

Science had anticipated the shift from the three year JC to the two year JC prior to 1985. They had already completed some revision to their syllabus and had developed student worksheets to address this shift. JSEIP provided two consultants who ran training workshops and assisted in editorial review and critique.

- Materials

Based on the feedback the writers received from teachers regarding the student worksheets, they began developing student texts and teachers guides which are to be in the schools in 1992/93. In addition to support from JSEIP advisors, two short term consultants helped with the final revisions of the 1 - 9 year syllabus, designing the syllabus, and setting up methods for formatively evaluating curriculum materials. Particular attention in documentary assistance was given to the general policy and procedures of mathematics curriculum development.

Mathematics

By the time JSEIP started, a great deal of development work toward addressing the shift from a three year to a two year junior secondary program had already occurred under the direction of the Secondary Department. Therefore, very little input from the JSEI Project was requested. JSEIP provided training in computer desktop publishing, skills that were used for new primary curriculum materials.

Design and Technology

- Syllabus

At the outset of the project, a technical studies curriculum comprised of wood work, technical drawing, and some metal work was in place. However, there was interest in revising the curriculum to conform with the philosophy of curricula in other parts of the world which prepared students to use a variety of technology and skills to solve technological problems. In setting a basis for this new approach, the design and technology advisor at the Molepolole College of Education helped develop a philosophy for design and technology in Botswana and further assisted in preservice and inservice training of teachers to understand the approach and the teaching methodologies this approach required. Later, a long term consultant was brought in to help develop a syllabus based on the philosophy. Along with the shift in philosophy, it was decided to change the name of the program from Technical Studies to Design & Technology.

- Material

Design and Technology has developed teacher and student materials (Learning Activity Packages) that are based on the syllabus, with technical assistance provided by JSEIP. The Form 1 materials were field tested in 1991 and will be implemented in about 70 schools in 1992. Form 2 materials will be field tested in 1992. In implementing this change, the hearts and minds of Field Education Officers and teachers have had to be won. While this was a formidable challenge, much progress has been made in this area.

- Innovations

The approach taken in Design and Technology is a relatively new one in Africa, although it has been used successfully in other parts of the world. It is a skill based, problem-solving approach requiring multiple-activities occurring within the same classroom. It uses a modular approach in student materials with each module culminating in the practical application of skills to solving a problem and a test to assess student achievement of other knowledge taught during the module. It emphasizes a broader technical awareness geared toward the needs and environment of the students and the application of knowledge from a variety of other subject areas, especially mathematics and science. It aims to help students to respond more appropriately to the technological needs and developments of Botswana. Even in the early stages of development, the program attracted the attention of other countries who are interested in adapting this approach to their programs. The development of this program also provided the opportunity to involve the Field Education Officers as well as teachers at the early stages of development and also included systematic formative evaluation of the materials and incorporated continuous assessment in the final evaluation of students.

VIII. JSEIP ADVISOR AREA ACTIVITIES AND PRODUCTS

A. CURRICULUM PLANNING AND EVALUATION (KENT NOEL, JSEIP ADVISOR)

Introduction

Much of what the curriculum planning and evaluation advisor has been involved in during the past six years and what has evolved through the project in those areas is described in other sections of this report, especially in sections five, six, and seven. His position was originally called "senior instructional systems designer" but since no one really knew what that was, the position was described as one of curriculum planning and evaluation. The purpose of the position was to advise officers in the systematic development of curriculum materials including the processes of needs assessment, development of aims, goals, and objectives, the development of curriculum materials and tests, the formative evaluation of those materials, and the implementation of curriculum. The role was to provide guidance in the processes of curriculum development (e.g., how to conduct a needs assessment or how to write an objective) as opposed to the development of a specific subject area. As such, the position spanned across all junior secondary subject areas and often across departments and operated both at departmental levels when policy decisions were required and at individual officer levels when a curriculum problem in a subject area needed to be resolved. Also, the adviser worked with a variety of consultants in conjunction with subject area officers when specific expertise in a particular topic was required.

From 1985 through 1991, the advisor worked with officers in every subject area to help them address the curriculum development problems at hand. Many of the results of that joint effort are described in other sections of this report. The following discussion will highlight some of the advisor's activities which have not been covered elsewhere.

Curriculum Coordinating Steering Committee

In 1985, the various units within Department of Curriculum Development and Evaluation (CDE) such as the Curriculum Development Unit (CDU) and the Research and Testing Centre (RTC) were spread throughout the city of Gaborone and regular communication between officers of those units was difficult Furthermore, communication between officers of CDE and other departments in terms of what they were doing regarding the junior secondary program did not seem to be conducive to a shared vision of curriculum development, teacher inservice, teacher pre-service, and school inspections.

To ameliorate this problem, the Ministry decided to form a Curriculum Coordinating Steering Committee (CCSC) and the advisor was asked to develop the terms of reference. That committee was comprised of representatives of each department and unit which had a stake in the development of the Nine Year Basic Education Programme and operated from 1986 to 1988. Its terms of reference were to discuss issues that might impact or be impacted by curriculum decisions, identify any cross-departmental problems that might arise, suggest possible solutions, and make recommendations to the Deputy Permanent Secretary. The committee was chaired by the Principal Curriculum Development Officer and the JSEIP advisor was the secretary. Anyone in the Ministry could ask the chairman to place an item on the committees agenda to be discussed. When special issues arose, those who were best placed to present the issues were co-opted to the committee. From time to time, subject area representatives were invited to update the committee on progress made in their curriculum area. Monthly meetings were held and minutes of each meeting including recommendations were sent to every education officer and school in the country. Attached to the minutes would be a three-month calendar of events to help officers

across the Ministry schedule workshops and meetings without conflicting with those of others.

National Subject Panels

Standardizing the national panel structure was a second way of dealing with the lack of communication. In 1985, there were primary panels and secondary panels which often operated independent of one another. Often the secondary panels, organized by Secondary Education Officers, made curriculum decisions and acted upon those decisions with little or no consultation with the subject's curriculum development officer. Likewise, the primary panels, organized by Curriculum Development Officers, made curriculum decisions with little or no consultation with the subject's secondary officer. Because the two years of the junior secondary program was to be more closely aligned with the primary curriculum, it was vital that the secondary and primary panels get together to discuss how this should occur. Therefore, the Ministry decided that National Curriculum Panels should be formed and should include both secondary and primary curriculum officers as well as representatives from the teacher colleges of education and other departments of the Ministry. Inter-departmental workshops and meetings were held to discuss the terms of reference of the new panel structure. Most national panels now conform to the standards that were set.

Materials Development Teams (MDTs)

Although the CDU was to be responsible for developing the junior secondary curriculum, they had a very small number of professional officers who were already overburdened with primary curriculum development efforts.

To address this problem in 1986, the Ministry with project support seconded to the CDU two teachers for each core subject area and one optional subject area to help develop curriculum for the junior secondary level. Those teachers along with the Curriculum Development Officer of their subject area formed a Materials Development Team. The terms of reference of those teams and some of the training for them was provided by the advisor through small group consultations and workshops for a wider audience of secondary education officers, some Molepolole College of Education lecturers, and officers of the Department of Non-Formal Education. Seminars in writing objectives, syllabus development, curriculum integration, materials development, and formative evaluation were conducted or organised by the advisor for the MDTs and others. By the end of 1989, the MDTs were disbanded and most of the seconded teachers were absorbed into Curriculum Development Officer posts.

Syllabus Standardization

Most syllabuses were teaching syllabuses which provided teachers with textbook references, teaching resources, and suggested teaching methods but did not contain the objectives that were to be taught. With a committee, the advisor helped design a basic outline for a standard syllabus to which all syllabuses that were under revision were to conform. The primary aspect of those syllabuses was that they contain the performance objectives of the curriculum.

Needs Assessment

It had been decided that one of the purposes of the Nine Year Basic Education Programme was to prepare students for post-junior secondary job training in addition to the academic program that only 40% of the junior secondary school leavers would be able to attend. To find out what types of skills post-JC training institutions required, a needs assessment was done. The advisor worked with a training needs assessment committee comprised of researchers from the Molepolole College of Education, the Examinations Unit, the Research and Testing Centre, and the University of Botswana

to develop instruments, try them out, conduct the assessment, analyze the findings and to prepare a report. (See Marope, 1987)

Social Studies, Setswana, English, and Science

The subjects of Social Studies, Setswana, English, and Science all received more attention of the advisor than other subjects at different times, all for different reasons.

Social Studies was a new subject to Botswana in 1986 and did not have a syllabus. The advisor worked with the national Social Studies Panel to develop the syllabus and based on their input, wrote and revised with the Social Studies Materials Development Team many of the early drafts of the syllabus. After the syllabus had been developed, materials had to be developed quickly because there were no adequate materials in the schools for teachers to use in Social Studies. A JSEIP-sponsored social studies specialist joined the MDT and the advisor to develop teaching guides and a teaching methods booklet to use while more formal textbooks and teachers guides were being developed. In 1989, a JSEIP-sponsored consultant in social studies worked with the Social Studies officers for a year to help design and develop social studies materials for the junior secondary curriculum; therefore, less of the advisor's time was required in that particular project. However, during the 1988-89 period, upon the request of the CDU and Molepolole College of Education, another JSEIP-sponsored consultant was contracted to help develop the *Botswana Social Studies Teaching Methods Handbook*. After consultations with tutors, lecturers and officers, the consultant developed a first draft of the material. Later, he returned to Botswana to formatively evaluate the draft and to revise it. The advisor edited the final trial edition for publication and it is now being used in schools throughout Botswana. After it has been used during 1992-93, plans are to revise the trial edition based on feedback from teachers and lecturers and to produce a final edition.

The Setswana panel wished to completely revise its syllabus to incorporate more aspects of the culture and to remove much of the formal grammar teaching that dominated the syllabus. The advisor worked with the panel to develop the syllabus and then proceeded to help them develop a scheme of work for teachers to use while student and teacher materials were being developed. After that was completed, the advisor worked with the Setswana MDT to design student modules to teach the new syllabus objectives. These modules have since been incorporated into a student text book.

The English panel wanted to make their syllabus more practical and relevant. Several years previously, what was called an intensive English program had been tried out in a number of secondary schools and had met with some success in terms of increasing student English usage skills, although it had not been implemented nation-wide. The panel with the advisor revisited that approach. Before many decisions were made, a new English CDO sponsored by ODA arrived at the CDU and was able to assume the English development responsibilities. A JSEIP-sponsored consultant joined him and the other MDT members in 1987 to help write new curriculum materials. Those materials were implemented in 1991 and are currently undergoing review.

By 1986, Science materials for the junior secondary level of the Nine Year Programme were already being tried out in the schools and plans were underway to develop student texts and teachers guides based on the materials. The advisor helped identify two consultants in science curriculum development who helped the writing team at various times and various stages of their project. The advisor also conducted a seminar on formative evaluation for them and helped formatively evaluate some of their materials under development. Their materials will be implemented nation-wide in 1992/93.

National Community Consultative Conferences

In 1988/89, a series of three national consultative conferences called, *Therisano Ka Thuto: Community Consultation on Basic Education for Kagisano*, were conducted by the Ministry with the support of JSEIP. The advisor organized and wrote the proceedings of the second and third conference of that series. In 1990, a JSEIP-sponsored consultant synthesized the proceedings of the three conferences into a report to the Ministry. The report provides a summary of what communities throughout Botswana feel is important in the education system and what they expect from it. (See Meyer, 1990)

Continuous Assessment

In 1990, the Department of Teacher Education requested the help of JSEIP in studying how continuous assessment is being taught in the teacher colleges and to advise the department as to how to proceed in ensuring that teachers use appropriate continuous assessment approaches in their classroom. The advisor worked with Teacher Education's Continuous Assessment Officer, a reference group, and two JSEIP-sponsored consultants to conduct the study. After the consultant report was received, the advisor worked with the reference group to evaluate the consultant recommendations, to revise them, and to present a set of recommendations to the Chief Education Officer.

Curriculum Data Base

Over the years, there have been a substantial number of requests from the Ministry to integrate special topics into the Nine Year Curriculum. Those areas range from Environmental education, AIDS education, entrepreneurial skills, road safety, and so on. In order to do so, one would always have to see what was already taught in the nine year curriculum and where it was taught and to determine where objectives of the new topic could be integrated. To help address this often tedious and time-consuming task, the CDU decided to develop a Computerized Curriculum Database to locate where in the curriculum various skills, knowledge, attitudes are located by topic, objective,and standard taught. In 1991, the advisor worked with a JSEIP-sponsored consultant and a reference group to help design such a data base. The data base was developed by the consultant as a prototype to demonstrate how it could be applied to solve curriculum integration problems as well as identify where syllabus objectives over-lap or are redundant. While four standards of syllabus objectives have been entered into the database and cross-referenced with practical topics for integration such as the environment and family life education, the remaining objectives of the Nine Year Programme still need to be entered before the data base can reach its full potential. The consultant trained the CDU's Media Specialist to operate to system and to input current and new data. (See DuPlessis, 1991)

CDU Curriculum Development Procedures Manual

During the last six years, general agreed upon procedures have evolved within the CDU for the development of curriculum materials. Several workshops have been held for CDOs and officers of other CDE units to discuss the procedures and agree upon standardized processes. To facilitate that process, the CDU requested JSEIP to provide a consultant to help commit some of the procedures to paper. This exercise ultimately led to the development of a draft Procedures Manual which will be used by CDOs for a year or so, at which time they will decide what final revisions needs to be made to it. The advisor worked with the Curriculum Planner and Curriculum Evaluator as well as the consultant in the developing the manual, consulting with the other CDOs, and revising the manual based on their comments. There are five chapters to the manual which features how to develop a syllabus with the proper format, how to develop a

curriculum blueprint, how to develop student and teacher materials, and how to formatively evaluate new materials. The advisor with the Design and Technology advisor and the Curriculum Planner edited the manual for the final version of the trial edition based on findings from a series of evaluation/critique sessions with CDOs.

Counterparts: Curriculum Planner and Curriculum Evaluator

In 1990, the CDU added the posts of Curriculum Planner and Curriculum Evaluator. The two people who filled those posts were assigned as counterparts to the advisor. The advisor worked with them as a team, providing on-the-job training as various projects arose. Both have been excellent people to work with although it is a shame that there were no posts for their positions earlier in the project. When the advisor was appointed Chief of Party of the project in December of 1990, the time he had to work with them was greatly reduced and that is to be regretted. However, the Curriculum Development Procedures Manual, Computerized Curriculum Database, and several formative evaluations of curriculum materials were developed with them during 1991 so one hopes that those products and experiences will serve them well in the future.

B. ART CURRICULUM DEVELOPMENT (LAURA IVES, JSEIP ADVISOR)

Introduction

Art is an optional subject in Botswana. Students taking art sit the Junior Certificate Examination (JCE) at the end of junior secondary study. Although the Ministry of Education Art Panel was officially formed in 1983 and a JCE in art was first administered in 1985, at the beginning of 1986 there was no teacher training program for junior secondary art teachers, no formal junior secondary art curriculum, and no inservice for art teachers.

Curriculum development and implementation in art, as well as teacher training, have shown dramatic growth since then. Progress to date through Peace Corps and USAID support is evident in teacher training at the Molepolole College of Education (MCE), curriculum development, inservice, localization, in-place methods of student assessment, on-going program dissemination activities, staff development, and employer outreach.

Expansion of Art Education in Botswana Since 1986

At the beginning of 1986, only four secondary schools formally taught art -- two at the community junior secondary level (CJSS) and two at the senior secondary level (SSS). There were but 70 CJSS and 30 SSS art students.

By 1987, art was taught as a credentialled subject in 11 junior secondary schools selected so that students showing promise might enter senior secondary schools that provided opportunities for continued art training. Art was at this time offered by seven senior secondary schools as a Cambridge O-Level subject. Approximately 200 students completed the Cambridge Art Examination in 1986 and of these, 10 applied for study at MCE as teacher trainees and several others began work in the private sector in art-related jobs such as sign painting, illustration, and graphic design.

As of 1991, there are four MCE art lecturers and 120 MCE art teacher trainees, 75 art teachers in 34 junior secondary schools where art is taught to approximately 5000 students, and 27 art teachers in 12 senior secondary schools where art is taught to approximately 2500 students. In 1991, 53 MCE art graduates teach art in junior secondary schools, 94 MCE students study art as a main subject, and 20 MCE students take art as an optional subject.

Peace Corps and USAID Support

The JSEIP art advisor's work started in Botswana in late 1985 and, until mid-1988, she served as a Peace Corps Volunteer heading the Art Department in the newly-established Molepolole College of Education. Originally there were no books or instructional materials for art methodology, art content, art appreciation, or art history. MCE's initial art curriculum for teacher training was designed during 1986 and art coursework in all media was provided to the first group of 10 students enrolling that year with art as a main subject.

With support from USAID and JSEIP, she joined the JSEIP team as art advisor in mid-1988, serving until mid-1990 in the combined acting roles of Art Curriculum Development Officer, Art Education Officer, and MCE Art Department Head. Work focussed at the junior secondary level. Duties since mid-1990 as Art Curriculum Development Officer have centered on the final development of junior secondary curriculum materials, criterion-referenced certification, continuous assessment, teacher inservice, and dissemination.

Botswana's Art Education Perspective

Art education is not simply a recreational school subject in Botswana. It is a discipline-based curriculum emphasizing skills training in drawing, colour painting, sculpture, commercial art, and crafts. Its broad aims are to enlarge problem solving and critical thinking abilities, enhance appreciation of the environment, deepen the quality of personal life, and guide student interests and skills into opportunities for advanced training, adult employment, and self-reliance. Goals of the art curriculum are to produce effective teaching, materials, and methods that, together with coordinated inservice, facilitate the learning of art skills and their creative applications. An essential feature of the art curriculum is its integration with other school subjects and with the world outside school.

Art curriculum development is viewed as a first stage in a wider development-dissemination-implementation-evaluation process. This perspective implicates teacher training and staff development at MCE, national certification testing policies of the Examinations Unit and the Research and Testing Centre of the Department of Curriculum Development and Evaluation (CD&E), teacher recruitment and placement, and inservice carried out by the Department of Secondary Education. Extensive and solid linkages across departments within the Ministry of Education are essential for the successful implementation of Botswana's art curriculum.

Botswana's junior secondary art program balances the practice and theory of fine arts, crafts, and commercial art in order to address the needs of Botswana's future economic development. Junior secondary art education reaches beyond the classroom by teaching art skills that have employment value. Public and private sector entrepreneurs and employers have been surveyed and are becoming better informed about art education in the schools. Their awareness of the program and how they can contribute to its design was an important objective in the integration of art-related career opportunities into the content of the art program. Junior secondary students and art teachers themselves are made aware not only of opportunities for art-related jobs but also how the art program prepares school leavers for further training and job entry.

USAID recognition that the art curriculum and employability directly related to its *Income and Employment Generation Strategy* led to development support in 1986. Although the basis for art education in Botswana was developed by the writer as a Peace Corps Volunteer in 1986-87, USAID support enabled the art curriculum to become involved in CD&E's work in other subjects, in certification testing, and in teacher inservice. CD&E and JSEIP provided office space and production resources.

USAID in addition funded a local survey of art-related employment opportunities in Botswana, the first year of the MCE Art Apprenticeship Programme, and counterpart training.

Teacher Training

Teacher training at MCE began in 1986 with no formal junior secondary art curriculum taught in the schools. In hindsight, this may have been an advantage since it meant that the design and development of the MCE art curriculum and the junior secondary art curriculum necessarily grew hand-in-hand.

At the start of 1986 when the MCE Art Department was established, the JSEIP art advisor was the sole MCE art lecturer and also served as department head. There were 10 first-year art student-teachers. Abel Manatsha joined the art department as a Motswana counterpart lecturer later in 1986. Even though he had no formal training in art education, he had worked professionally as a self-taught artist since 1976 and had taught English and history at the senior secondary level since 1980.

In 1987, the MCE Art Resource Centre was established containing books, a lesson plan bank, a test item bank, educational videos and films, and tapes to be used for research, experimental activities, and the development of teaching activities to insure that junior secondary schools programs would remain current, relevant, and strong. 1987 also saw the initial MCE three-year art teacher training syllabus completed, plans for Abel Manatsha's overseas study program prepared, and a second counterpart lecturer identified.

The MCE Art Teaching Laboratory was organized and implemented in 1987 and has continued since then. Pupils from junior secondary schools in and around Molepolole participate two terms each year in a mini-teaching laboratory taught by first-year and second-year MCE student-teachers. This prepares them for practice teaching. Each MCE art student teaches two laboratory double-periods (160 minutes) each year, with their teaching both staff-supervised and peer-critiqued.

By 1988, MCE art student enrollment was 10 third-year students (completing in 1988), 19 second- year students (completing in 1989), and 20 first-year students. By 1990, the art department had grown to four staff lecturers and MCE art student enrollment was 19-third year students, 18 second-year students, and 36 first-year students. First year intake for 1990 and thereafter was fixed at 40 students.

When the first art program entrants were scheduled to graduate in 1988, an external examiner was recruited, as required by MCE policy, to certify each department's quality of instruction and the way each evaluates student performance. The art department's final comprehension examination papers for third-year students were prepared, administered, and marked. These are yearly activities. Nine MCE-trained art students completed the MCE art program in 1988 and entered the teaching force in 1989 as the first certified Botswana art teachers. Placement of this group of MCE graduates was closely planned with the Secondary Department's Advisor for Headmasters.

The Art advisor continued as MCE art department head through mid-1990, working with three other art lecturers, with Abel Manatsha in overseas training. At the end of 1990, materials and their use in the MCE Art Resource Room had been strengthened with further acquisitions. The "Art Programme Course Description" (for MCE's three year art program) and the art teaching practice manual, "Guidelines for Student Art Teacher," were revised and completed.

Curriculum Development-Formative Evaluation-Inservice

In early 1986, a brief visit was made to evaluate arts-related training and work programs in Zimbabwe and a report written for the Ministry. Inspection of these programs led to the conclusion that most of their features did not specifically address Botswana's art education needs. The Botswana program was intended to go beyond simple content and media specification; it had to conform to junior secondary curriculum design requirements for all subjects, emphasize problem-solving through skills application, be tied to Botswana's employer needs, use material found in the local environment, and show cost effective implementation.

First drafts of the junior secondary art syllabus, teacher's guide, and the two-year junior certificate examination in art were completed in 1986. In 1987, initial drafts of the junior secondary art syllabus and the junior secondary art teacher's guides were written.

Inservice programs for art teachers were developed in early 1987 in order to effectively implement the new art program. Plans were made in 1987 to evaluate and revise junior secondary school art materials. The idea initially arose then to survey the extent of art-related jobs in the public and private sectors and to explore the kinds of art vocations and careers that relate to the content of secondary and college-level art curricula. Design and first writing of materials continued throughout 1988. Modularized units were developed for Forms 1 and 2. Materials included the syllabus, teacher's guides, and visual aids. One instructional unit was developed for each term of each year.

Form	Term 1	Term 2	Term 3
ONE	Unit 1 *Drawing*	Unit 2 *Painting*	Unit 3 *Crafts*
TWO	Unit 4 *Commercial Art*	Unit 5 *Sculpture*	Unit *Revision*

In mid-1988, an art lecturer at MCE was contracted by JSEIP as an art curriculum writer. At that time, the Botswana National Art Panel, which consists of members from MCE, Teacher Training Colleges, the University of Botswana, secondary schools, and the National Museum and Art Gallery served as an advisory board for the development of the junior secondary art curriculum.

Implementation and formative evaluation of the new curriculum materials started with their introduction in the first term of the 1989 academic year. Specifically, the junior secondary art syllabus for Forms 1 and 2 and an art syllabus introduction were distributed at the start of Term 1 in 1989, together with syllabus sections for Unit 1 and Unit 4. Materials also included the teacher's guides and visual-aid packets for Units 1 and 4. Prior inservice was carried out. A data collection form was designed to formatively evaluate the implementation and use of the new curriculum materials. This form was used to evaluate all units, with items tailored for each unit.

The art lecturer at the Lobatse TTC was instrumental in developing the proposal "Training Course for Primary Teachers," which dealt with the training of TTC teachers to become inservice art teachers, and were also used to help design a format for "Primary Art Learning Activities," a manual presented and favourably received at the National Curriculum Conference for TTC Lecturers. This led to a 1989 proposal, "A Training Course for Primary Teachers."

From mid-to-late 1989, drafts of the junior secondary art syllabus and teacher's' guides were written for remaining units, as well as visual-aid packets prepared as teaching supplements.

Although there was no formal post, a qualified art teacher from a CJSS in Molepolole was recruited informally as field education officer for the 1989 inservice art program and inservice art workshops conducted for secondary teachers. Art educators discussed art content and methods and local craftspersons demonstrated techniques of pottery, wood carving, basket weaving, and wall decoration, etc. The officer was able to visit art teachers at their schools and assist them in teaching the new curriculum.

During 1990-91, syllabuses and teacher's guides were revised for Units 1-5. Field testing and formative evaluation were carried out for all term units in Forms 1 and 2, a sample format for the student workbook was prepared, and meetings were held with Macmillan to discuss materials revision and cost estimates. Final versions of the Junior Secondary Syllabus, Teachers' Guide, and visual aid packets were completed and sent to the publisher in December, 1991.

Supplies/Equipment requisitions are organized for new schools offering art as an examinable optional subject. Arrangements are made with Boipelego to supply new community junior secondary schools that start an art program with P10,000 worth of art materials, with each school given an additional P16 a year for each junior secondary student who elects to study art. MCE and the Department of Secondary Education work together with the United Teaching Service (UTS) to place art teachers in new schools.

Summative Evaluation

Art, like home economics, technical studies, and religious education, is an examinable optional subject. All junior secondary students sit the Junior Certificate Examination (JCE) in one optional and six core examinations. The JCE is a national certification examination and performance on the JCE is the main determiner of selection to senior secondary school. The Art JCE examines theory with a 50 item multiple-choice test and practice with a portfolio of rated student artwork, consisting of a student drawing, painting, sculpture, craftwork, and one artwork in any media.

It is intended that art teachers learn assessment skills and how to critically evaluate their students' performance, not only for the improvement of their own continuous assessment procedures, but also to become part of the certification process. JCE item specifications were developed and, from them, a pool of test items were developed. One of the more significant steps taken was the implementation of a marking scheme and forms used to rate portfolio artwork on indicated criteria. Roughly two hundred photographs of artwork from the 1990 JCE along with their completed assessment forms have been compiled for publication for the book, *A Report on the National Standards for the Junior Secondary Art Examination*. This book is being distributed to the art teachers and will serve as a guide when assessing student artwork.

The number of art students taking the JCE is growing rapidly from year to year. Over 1300 students sat the 1990 Art JCE and submitted over 6500 pieces of portfolio artwork to be rated. These numbers will grow larger each year, so a large share of portfolio artwork assessment must be turned over to teachers, with possibly only one or two pieces of submitted artwork rated by Examiners. This means that a version of continuous assessment will become a basis for certification together with the JCE test.

The 1991 Art JCE was developed according to criterion-referenced test (CRT) procedures. The complete blueprint of to-be-tested objectives for all units has been prepared, as well as item specifications and model items, for multiple-choice testing. The 1991 test was constructed using items written by teachers and staff who attended two CRT workshops.

Curriculum Dissemination

Earliest dissemination activity in 1986 involved recruiting an art consultant, Bianca Van Dorp, as writer for the newsletter, *Art Mo Botswana*, and organizing a junior secondary travelling art exhibition. During 1986, a communication network among art educators was developed for teacher trainers at the primary, junior secondary, and senior secondary levels through a yearly publication of this art newsletter. The goal was to communicate art education activities to schools and the private sector. This linkage increases the awareness of how arts-related training is growing in education and has relevance to the community. More importantly, it enables the private sector to react to and influence the content of the arts-related curriculum developed and taught. The first *Art Mo Botswana* was produced in 1988 and distributed to arts-related employers in the Botswana private sector, to Departments of Education, to museums in SADCC countries, and to art education programs in Europe, the United States, and Canada.

In early 1990 an Secondary Education Officer was recruited for Art. The SEO is responsible for disseminating information to the schools and for assisting teachers and headmasters with any problems in teaching, curriculum, or administration concerning the subject.

Exhibitions are an effective, well-received, and popular means for dissemination. The art advisor served on committees to plan and start the Molepolole Museum Art Gallery, and organized student artwork exhibits at the Ngwedi Stairs Gallery in the MCE library, junior secondary student exhibits, and exhibits of MCE student artwork. Selected MCE student artwork was exhibited in 1988 in both the Professional Art Exhibition and the Student Art Exhibition at the National Art Museum and Gallery. The same year the art advisor organized and opened a selected exhibition of JCE student artwork at both MCE and the University of Botswana, as well as a College and Secondary Art Exhibition at the University of Botswana.

In 1989, the art advisor opened the Ngwedi Stairs Gallery at MCE, organized exhibitions of MCE student artwork at CD&E in Gaborone, and supervised the involvement of Marothodi Fabrics which awarded prizes to two MCE students for best designs that were commercially used in 1989. Art Calendars for 1990 and 1991 featuring the best junior secondary student paintings were produced by the Examinations Unit. These have strikingly spread awareness of Botswana's art program both locally and overseas. The Secondary Education Officer produced the 1991 MOE Calendar and postcards of secondary student artwork.

Art-Related Employment Opportunity

Employer demand for personnel with art training in their general schooling far exceeds expectations. The Ministry of Finance predicts an annual increase of over 600 art-related job opportunities in Botswana. Future development and expansion of the economy in all sectors will further increase employment prospects for school graduates with a background that includes training in basic art techniques and a desire for imaginative and creative work. Examples are in the fields of advertising, commercial artwork, and textiles design. Tourism in Botswana exerts a growing and powerful influence on the economy. As the industry grows, shown by increasing numbers of new hotels, safari lodges, craft boutiques, so will the demand for local craftspeople and designers. In rural areas, secondary school graduates will find jobs in areas such as jewellery, sign painting, basket/craft designing, pottery, and wood-carving.

In urban areas, the majority of art-related jobs are currently held by expatriates. This can change. In the private sector, several firms have expressed interest in providing company job-training opportunities for Batswana. Among these are Botswana Enterprise Development [BEDU], Botswana Development Corporation who are the

owners of the Marakanelo Hotels, Botswana Game Industries, the Mochudi Museum, Tiro Ya Diatla Weavers, Botswana Government Printers, Marothodi Screenprinting, Botswelelo Pottery, Botswana Crafts, Games Studios, Silkscreening Ltd., The Botswana Guardian, The Reporter, and Oodi Weavers.

A 1989 survey carried out by SIAPAC through the USAID-funded "Art Education and Art Employment Research" project interviewed employers in private and public sectors to determine what types of art-related jobs now exist, how many of these jobs exist at various levels of employment, how employers find employees, how job-seekers find available employment, what sorts of non-formal or on-the-job training occurs, and what kinds of art-related employment can be projected. Findings from over 100 employers were: many employers were largely unaware of the new art program; recruiting and job-seeking were informal; job-seekers obtained job availability information from friends or relatives (who were often already employed by the hiring employers). Employers applied few criteria other than O-Level English and mathematics for selection. Job training was conducted mainly by employers. One of the most significant findings was that most of the employers' artwork production was sent to the Republic of South Africa. This obviously calls for better dissemination, more awareness of the art program, and greater support for localized advance training. Review and revision of the junior secondary art curriculum have been made in light of this survey data.

A further career linkage was explored with the Principal Officer of the Career and Guidance Counseling Unit in CD&E. Her school survey data show that career staff in junior secondary schools urgently ask for much more career information material. The survey in art and similar surveys in other subjects could guide the development and distribution of material for dissemination to career masters and teachers as well as to employers.

The MCE Art Apprenticeship Programme, sponsored its first year by USAID through JSEIP, was started in 1989 and has continued each following year with Ministry funding. Student teachers are placed three weeks each year with private sector employers or self-employed entrepreneurs to gain art-and-craft-related work experience between terms of study at MCE. The MCE Art Apprenticeship Programme receives strong endorsement from students and employers and is now funded by the Ministry of Education.

Staff Development and Localization

Staff development first involved the recruitment of counterpart MCE lecturers in the art department who must be responsible for future teacher training. At MCE, the first Motswana counterpart lecturer was locally trained through the last half of 1988 when he left for overseas study. The art advisor recruited and trained a second Motswana counterpart (Justin Tafa) as his immediate replacement. In early 1989, she recruited a Peace Corps Volunteer as MCE art lecturer beginning with the second term of the year.

Training in all areas to localize all components of the art program through pre-service, inservice, and overseas training is now a pressing necessity. Many key posts are now either vacant or held by expatriates who must eventually be replaced. There is the high priority to provide regular supervision and guidance. There is an immediate need to begin training senior secondary school teachers and art tutors for primary teacher training colleges (PTTCs).

It is projected that the following posts need to be filled with trained professional Batswana art educators within the next few years: 130 junior secondary and 50 senior secondary art teachers; 5 MCE art lecturers, 8 PTTC art lecturers, and 4 University of

Botswana art lecturers; 4 Field Education Officers, 2 Senior Education Officers, and 2 Curriculum Development Officers; and 6 Teacher Advisors at the primary school level.

This need for increased numbers of Batswana art educators was addressed in the consultation visit of Dean Draper from Florida State University. As a result of many discussions and country-wide on-site visitations, he has recommended various options that combine programs at Florida State with those in Botswana that together could help resolve the shortage of art educators in Botswana. His consultation paper is under review and active steps to implement decided-upon art training programs are expected.

C. Design and Technology Curriculum Development (Janet L. Robb, JSEIP Advisor)

Design and Technology is an educational program that applies knowledge from a variety of other subject areas, especially mathematics and science. It aims at helping the young citizens of Botswana to respond more appropriately to the technological needs and developments of their country. Design and Technology strives to provide students with the opportunity to be creative and inventive, to analyse and solve problems, and to explore and experiment. The program does this through teaching design and problem solving, materials and processes, and their interrelationship and interdependence.

Overview

Until 1986 the optional subjects of woodwork and technical drawing were offered in the junior secondary schools of Botswana. With the move to a 7-2-3 curriculum structure, these two subjects were combined into one optional program called Technical Studies. Technical Studies combined the content of woodwork, technical drawing, and some metal work into one two-year program. About this time, it was also noted that Technical Studies should "provide a new and broader technical awareness...and to gear that awareness more closely to the needs and environment of the students." However, other than combining the content areas, no curriculum changes were made.

At the start of the 1989 school year, the program name Design and Technology was used instead of Technical Studies. This, it appears, was an attempt to downplay the vocational nature of the curriculum at the junior secondary level and to align the program more closely with the changing trend toward Technology Education that was occurring internationally. It was also an attempt to establish a plan to meet many of the goals and objectives set forth by the Ministry of Education's Nine Year Basic Education Plan. However, just as in 1986, the name change was not directly accompanied by a change in content or methodology.

In April 1989 a paper was prepared entitled *"A Philosophy of Design and Technology for the Community Junior Secondary Schools in Botswana."* This helped lay the groundwork for a new program. In May 1989 two short term consultants were contracted to work with the Curriculum Development Unit (CDU) and with JSEIP to help establish the framework for a new set of curriculum materials for Design and Technology. This added structure and direction to the newly established philosophy. These consultancies resulted in a preliminary schematic that would be representative of the new two-year program and in the initial format and content outline of the curriculum materials themselves.

With the start of the 1990 school year came a concerted effort on the part of the Curriculum Development Unit and JSEIP to see the philosophy, structure, and content put into practice. This has resulted in an entirely new set of curriculum materials, teaching methodologies, and inservicing activities. Presently the new materials are being piloted and evaluated in 16 community junior secondary schools throughout

Botswana. This involves 24 Design and Technology teachers and approximately 2000 students. Implementation of Form 1 material will occur in January 1992.

The Curriculum Materials

Writing began on the new set of Design and Technology curriculum materials in January 1990. It was determined, at that time, that three publications would be appropriate for the curriculum. These include a Student Workbook, Teacher's Handbook and Student Text.

- Student Workbook

  The workbook is made up of a series of Learning Activity Packages (LAPs). Each LAP was developed to teach the specific objectives contained in the Design and Technology syllabus. Each LAP is made up of a "first" page that states a description of the activity, a list of objectives the students should learn, a task they must perform or problem they must solve, the specifications they must follow, the supplies needed, and a list of what they must hand in for evaluation. The following pages of each LAP are made up of the procedure the students must follow to complete the LAP. Many LAPs include a Check Your Knowledge worksheet designed to give the students an opportunity to show how much they learned from doing the LAP. When design problems are presented in a LAP a Self Evaluation form is included so that the students can critique and analyse their own work.

  The structure of the activities progressively introduces the stages of design and problem solving. Through the activities, the students learn the fundamentals of design and technology and progress through a series of increasingly more complicated concepts and processes. By the end of the program, students are tackling problems that draw on their knowledge of various materials and processes, structures, mechanisms, and energy.

- Teacher's Handbook

  The focus of the handbook is to help the teachers plan and prepare the day-to-day activities of the Design and Technology classroom. It is designed to accompany the Student Workbook and details such items as planning lessons, sequencing activities, gathering resources, scheduling time and continuous assessment. Every LAP detailed in the Student Workbook is explained in the Teacher's Handbook. This explanation provides lists of prerequisite skills that must be taught, ways in which to teach them, strategies for introducing the LAP, and the criteria for evaluating each LAP.

  The Teacher's Handbook is a loose leaf document printed on A4 size paper, single sided and two-hole punched. This will enable the teachers to store the pages in a notebook, add their own notes and additional pages, and remove the continuous assessment evaluation sheets as needed.

- Student Textbook

  The textbook will serve as a general introduction to Design and Technology. It will be used by students as a reference and resource guide throughout the two-year junior secondary Design and Technology program in Botswana. The text is designed to be motivational in its attention to career and training options, technologies and technological developments in Botswana, and entrepreneurial successes and opportunities.

  Features play a major role in the Design and Technology textbook. These are short items of interest that bring the study of design and technology into a local

context. Each feature falls into one of the three classifications: career/training opportunities, entrepreneurial endeavours, or a specific technology. The features are tied directly to the content in the textbook, are written by local teachers, and are about people, industries, products and situations found in Botswana.

Reference and Advisory Groups

The development of the curriculum materials for the Design and Technology junior secondary program has involved a number of individuals who have served in advisory and/or reference capacities. Most of these can be classified as belonging to one of four groups: Field Education Officers (FEOs), Molepolole College of Education (MCE) Design and Technology lecturers, Design and Technology teachers (both junior and senior secondary), or private sector industrial personnel. A National Curriculum Panel for Design and Technology serves as the formal advisory group for all curriculum decisions that go forward to the Ministry of Education.

- FEOs

  The FEOs are teacher inservice officers and they served as the initial reviewers for all materials developed. Their involvement provided input in the establishment of the course framework, content, specific learning activities, and classroom management. The FEOs were involved, to a limited extent, in the actual writing of materials and, to a much greater extent, in the editing and revising of materials produced by the CDU. Between April 1990 and May 1991 the CDU Design and Technology team held six workshops/meetings with the FEOs to specifically plan, review, and revise the new curriculum materials. In addition, during the same timeframe, the FEOs played a significant role in three orientation and inservice workshops conducted for the teachers and headmasters involved in the trial of the new materials. An FEO representative also serves as a member of the National Curriculum Panel for Design and Technology.

- MCE Design and Technology Lecturers

  The MCE lecturers serve in much the same capacity as the FEOs, however, to a somewhat lesser extent. In addition, they are responsible for including the new curriculum content and methodology into the Design and Technology coursework at MCE. Between June 1990 and March 1991, the CDU Design and Technology team held six meetings that involved the MCE lecturers. In addition, the team conducted an orientation session on the new curriculum materials for all MCE Design and Technology students and lecturers and conducted a hands-on workshop for the students who would be doing their teaching practice in schools involved in the trial process. An MCE representative also serves as a member of the National Curriculum Panel for Design and Technology.

- Design and Technology Teachers

  In addition to the 24 junior secondary teachers who are involved in the trial process for the new curriculum materials, a number of other teachers are also involved in the development process. Four junior secondary teachers were responsible for pre-trialling learning activity packages to help assess readability level, level of difficulty, time allotment recommendations, and appropriateness of activities. Two teachers, one each from junior secondary and senior secondary schools, serve as members of the National Curriculum Panel for Design and Technology. Sixteen teachers make up a writing team responsible for generating the features to be used in the student textbook. Therefore, a total of 44 Design and Technology teachers from throughout Botswana have direct input into the

curriculum development process. This is well over 20% of all the Design and Technology teachers in the country.

- Private Sector Industrial Personnel

  Three representatives from private sector industry in Botswana serve as members of the National Curriculum Panel for Design and Technology. In addition, other key reference people are contacted with regard to technologies and technological developments specific to Botswana, properties of various indigenous materials, and availability of resources.

- National Curriculum Panel for Design and Technology

  The National Panel is made up of 13 members. These include representatives from industry, University of Botswana, Teacher Education, Secondary Department, Botswana Polytechnic, FEOs, MCE, teachers, and the Curriculum Development Unit. The main function of the Panel is to advise the curriculum developers.

Trial Process and Formative Evaluation

The new Design and Technology curriculum is a significant departure from the existing program in the junior secondary schools which focuses mostly on wood, metal, and technical drawing. Due to the radical differences between the existing and the new curriculum materials, a formal trial of the new materials is taking place. The trial of the Year 1 materials began with the start of the 1991 school year. The trial of Year 2 materials will begin with the 1992 school year.

Sixteen community junior secondary schools throughout Botswana are involved in the trial process. The schools are located as far north as Maun and as far south as Lobatse. There are no more than three schools in each FEO region. This helps to provide maximum supervision and inservicing for the trial teachers. Twenty-four Design and Technology teachers are located in those schools and approximately 2000 students are enrolled in the Design and Technology course. This is well over 10% of the total junior secondary Design and Technology teachers and students in Botswana.

All of the teachers involved in the trial process are inserviced on the new materials. This takes place in hands-on workshops conducted by the CDU and the FEOs. Each learning activity package in the new material is explained and completed by the teachers. They are inserviced on suggested teaching management strategies, the equipment and supplies required, and the criteria for evaluation of each activity. Each term of material is inserviced separately prior to the start of that term within the school year.

Monitoring of the trial process takes place by utilizing four groups of monitors: the CDU, FEOs, Research and Testing Officers (RTOs), and MCE, in addition to the trialling teachers themselves.

The CDU Design and Technology curriculum development team and the CDU Planning and Evaluation team serve as general monitors. They assess such things as acceptability of the materials, student and teacher attitudes, and overall "workability" of the curriculum package.

Each FEO is responsible for monitoring trial schools in their region. FEOs look at specifics of the curriculum package. This includes sequencing of activities, appropriateness of activities, adequate information for both the students and the teachers, level of difficulty, ease of implementation, continuous assessment, supplies, equipment, etc.

RTOs play an active role in monitoring the continuous assessment portion of the new curriculum. They are concerned with ease of use, level of understanding and the development of standards. In addition, they monitor the development of test item specifications and the development and implementation of the end-of-year 1 exam, the final project, and the course exam.

MCE monitors the trial process on a more informal basis. They are most concerned with the type and level of teacher preparation needed to teach and implement the new curriculum materials.

Throughout the trial process the teachers are provided with formative evaluation forms to complete regarding each learning activity package. These are designed to help them formalize their comments, concerns, and suggested revisions. In addition, each teacher is provided with an evaluation copy of the materials so that they can mark changes directly on the pages from the Student Workbook and Teacher's Handbook.

Each headmaster and Field Education Officer is provided with formative evaluation forms to be completed at the end of each school term. These are designed to help them formalize their comments and concerns with regard to the management of the new curriculum, the teacher's ability to adapt to the new materials, and the reaction of the students who are being taught using the new materials.

All formative evaluation forms, together with notes from school visitations, interviews of both the headmasters and teachers, and notes from an end-of-term meeting of all trial teachers make up the documents used for directing the revisions of the trial materials in preparation for nationwide implementation.

Continuous Assessment and Examinations

In the past, when a student completed the two year Design and Technology (Technical Studies) program of study they completed a practical and a written exam. These two items were the only two grades used to determine if a student passed or failed the course. However, many different activities were assigned the students throughout the two year program.

The practical exam consisted of a working drawing of a product for the student to build. Every student throughout the country built the same product, to the same specifications and out of the same material. The finished product was graded on the manipulative skill displayed and the overall appearance of the piece. The written exam was prepared by an examination team made up of MCE lecturers, FEOs, and Design and Technology teachers. These exams, although conscientiously prepared, did not necessarily reflect the objectives of the overall program.

The new continuous assessment package allows for more input into the student's final grade. Sixty percent of the final grade will now be based on activities completed throughout two years. Forty percent will be somewhat comparable to what was used for the entire score in the past. A further percentage breakdown is as follows: 20% - Year 1 LAP scores, 20% - end of year 1 exam, 20% - Year 2 LAP scores, 20% - final course project, and 20% - course exam.

Since continuous assessment is a new concept in Botswana, special attention is given to implementation strategies. The teacher is unprepared to effectively implement continuous assessment without strong support materials to assist in the evaluation and set standards of performance by which to evaluate activities. In addition, teachers need to be inserviced on the use of the new curriculum materials and must be monitored by experts to assure understanding and consistency of evaluation.

Evaluation forms have been developed for every activity the students complete that is to be graded. The evaluation forms are designed to guide the teacher through the evaluation process. Each evaluation form is distinct to the activity that is to be graded. The criteria for evaluation of the activity is listed, along with a definition for each criteria. Also provided on each evaluation form are scoring directions. These directions show the grading scale that should be used and provide step-by-step directions on what to grade, where to record the grade, what scores to average, and what makes up the total grade for each activity. Other support materials include evaluated examples from trial classes and, eventually, a standards guide.

Simultaneously as the teachers are inserviced on the activities that have been developed for the Design and Technology classroom they learn the criteria by which they must evaluate the activities. Standards are presented to the teachers by having them evaluate completed student activities and compare their scores to the established standards. Practice and discussion help teachers to become comfortable with their assessment ability and with obtaining results that are consistent with the standards.

Botswana is in the process of establishing criterion referenced tests (CRT) for all the curriculum areas in the junior secondary program. The reason for converting all exams to CRT is threefold:

- to guarantee that students are tested on course objectives,
- to provide a blueprint for teaching rather than a test, and
- to obtain a variety of reliable statistics based on the test results.

The Design and Technology syllabus for the two-year junior secondary program is used to develop test blueprints, which in turn are used to establish test item specifications. Test item workshops are planned to help generate a test item bank that can be used in preparation of exams.

Curriculum Dissemination

The start of the 1992 school year will mark the nationwide implementation of the new Design and Technology program for the junior secondary schools of Botswana. In preparation, the headmasters will be briefed as to the intent and extent of the change during their 1991 headmasters meetings. All junior secondary Design and Technology teachers will be invited to an orientation workshop to be held at the end of August 1991. At that time, the new materials will be introduced and the new continuous assessment and evaluation procedures will be detailed. All of the trial teachers will be on hand to lead discussion about the new materials and to answer questions dealing with implementation into the classroom. In addition, the FEOs will continue to work in their capacity as inservice personnel to assist the teachers with new content and management strategies, as necessary, and MCE will continue to incorporate the new materials into their teaching schemes.

Counterpart Development

The full-time curriculum advisor in Design and Technology arrived in January 1990, following two short term consultancies in previous years. In addition to curriculum development responsibilities, the Design and Technology curriculum advisor's role included working with the Design and Technology Curriculum Development Officer (CDO) in a counterpart relationship. This relationship involved both training and "shadowing." A list of skills necessary to perform the job of a Design and Technology CDO was formulated and a scheme of training was developed. An organized plan of "shadowing" was established for the CDO. The main responsibilities of the Design and Technology curriculum development process were planned, organized, and carried

out by the curriculum specialist. The CDO was present and involved at every stage. This was in order for the CDO to "see" the curriculum development process first hand. Shadowing took place in the office, at meetings, workshops and conferences. Eventually, as the CDO became knowledgeable and confident about performing certain tasks on his own, he took on the leadership role with his counterpart present. This allowed for dialogue to take place "after the fact" so that the CDO could learn from being observed. Gradually, the CDO and the curriculum specialist became a team that could function both independently and together, depending upon the situation and the confidence of the CDO.

Products Completed by the End of JSEIP

- Trial of Editions of Formal Student Workbook and Teacher's Handbook for Years 1 and 2
- Final Editions of Student Workbook and Teacher's Handbook for Terms 1 and 2
- Final edited manuscript of Design and Technology Student Text submitted for publication
- Information packet to introduce the new Design and Technology curriculum
- Set of overhead transparencies to be used in the orientation of the new materials
- Wall flow-chart of the curriculum development process for Design and Technology for use by the CDO

D. TESTING (JOHN BOWERS, JSEIP ADVISOR)

Introduction

USAID/JSEIP's support for Botswana's national test programs has effected substantial change in testing policy, has upgraded research capability, and has provided strong staff training. This report is organized under these three areas, with a short final section treating future possibilities.

No JSEIP advisor can ever claim credit for change. Institutions change themselves. Change is realized by redefining roles to achieve new task objectives through different ways that activities are organized and carried out. An advisor is at best a facilitator who must become thoroughly familiar with how work is accomplished, identify problems and communicate them to counterparts, and proposes resolutions acceptable to the host institution and at the same time enlist USAID support under JSEIP terms of reference.

First Posting of Advisor

Although implemented as a curriculum development project, JSEIP started with no advisor for curriculum test development. In January 1986, the current advisor for Testing joined the education department of the Molepolole College of Education (MCE) as an advisor in Teacher Certification. Two tasks were assigned: first, to assist staff in administering the MCE teaching practice placement program starting in April 1986; second, to develop MCE education courses in testing and measurement.

A computer data base was developed to place approximately 300 student-teachers each year in 70 secondary schools for nine weeks of practice teaching during their second and third years of study. Work also entailed the design of teaching practice observation and assessment instruments. Classes in classroom assessment were taught to second and third year students in 1986-87. MCE marking procedures and marking disparities across departments were studied and reported in 1988.

Advisor's Move from MCE to RTC

The advisor began work with the Research and Testing Centre (RTC) in 1987. He officially moved from MCE to the RTC in C&DE as the Testing Advisor in 1988. The RTC has the responsibility for the technical quality of the Primary School Leaving Examination (PSLE) and the Junior Certificate Examination (JCE), respective national certification tests for primary and junior secondary school completers. Two sets of JCE tests in every subject had to be prepared in 1987 to examine both the first cohort of two-year junior secondary completers as well as the final cohort of three-year junior secondary completers. The advisor for Teacher Certification at MCE assisted RTC in developing 1987 JCE tests.

In 1988 after the USAID mid-project evaluation, arrangements were made for the advisor's transfer from MCE to full-time duties in RTC. A workscope was prepared and endorsed by the Principal Officer of RTC. This included tasks in certification test development and research. Much of the work dealt with day-to-day test production activities.

USAID/JSEIP Support for National Testing Programs

Because the main function of the PSLE and the JCE is to select applicants for further schooling, official test policy standardizes each JCE subject's raw scores to a common scale in order to equalize their weight in the aggregate standard score used to select applicants for available school openings. It is important to realize that subject marks were (and are now) determined by the same standard score conversion. The consequence is that the proportion of "A, B, C, D," and "E" marks are roughly the same for each subject each year. Test marking was and is still norm-referenced.

People probably expect test marks to inform them how much a student has learned. Teachers, parents, students, and the public believe that test marks should identify what students know and can do in reference to curriculum objectives rather than indicate their rank order in the group of students taking the same test. They might not use the words, but they want criterion-referenced marking. Problems arose because norm-referenced marks were misinterpreted as though they were criterion-referenced.

- First Steps to Improve Test Construction Practices

  Gaining familiarity with on-going test construction practices pointed to the need for tighter item and test specifications, especially with large-scale curriculum revision underway in the Curriculum Development Unit (CDU) in CD&E. Test development needed to be more closely tied to curriculum objectives, and CD&E control of test development was essential if this was to happen. A major problem was, and in some cases still is, reluctance on the part of the officers in the Department of Secondary Education (DSE) to relinquish what up to then had been their historical ownership of test development.

- Reintroducing Test Blueprints

  With the time that the advisor joined the RTC, test item writing was based on a syllabus or on items appearing in earlier tests. Test blueprinting had been practiced earlier by RTC but because of workload and understaffing, it had fallen into near-disuse. During 1988, the advisor adapted an item preparation blueprint so that subject panels might cross-classify items-to-be-written by content topic and by level of learning (higher order thinking, applications/rules, concepts, knowledge facts). This enabled RTC staff to revitalize test blueprinting to some extent when working with subject examination panels. Panels in art and in social studies quickly adopted the use of rudimentary blueprints for item preparation. In 1988, a Senior Research Testing Officer joined the RTC on return from the

JSEIP-supported master's degree program at Florida State University and has been instrumental in working with CDU and with subject panels to strengthen test construction procedures.

- Item Writing

  JCE and PSLE item format specifications prescribed multiple-choice, short answer and extended response items, as well as practical tests in some subjects. RTC held workshops for item writers (experienced teachers) and codified rules for preparing various types of items. Item writers prepared test questions which were then edited and readied by RTC for trial testing. As practiced in the past, often the item writing workshops could be characterized more as exercises in avoiding common test item writing problems rather than as exercises in specifying how to write items tightly referenced to objectives to be tested.

- USAID/JSEIP Support of the Right Consultant at the Right Time

  The time was ripe to move away from a completely selection-oriented (norm-referenced) testing basis. Though selection would remain an important function of national testing, continuous assessment, curriculum evaluation, and the use of tests for diagnosis were increasingly recognized as important but missing test functions. RTC saw the necessity for staff development as the means to change testing practices. Change would require a long-term strategy to move towards curriculum-driven testing and reporting.

  In early 1989, USAID/JSEIP supported the first short-term consultancy for Dr Anthony Nitko, a leading authority on criterion-referenced test methodology. Terms of reference for Dr Nitko's initial short-term contract were the following:

  1. Elaborate a curriculum-based testing perspective for national subject examinations.
  2. Identify continuous assessment models for classroom testing and assessment by teachers; combining certification and continuous assessment in the JCE was to be kept in mind.
  3. Examine the Junior Certificate Examination and improve ways to assess student products in art, technical studies, and agriculture.
  4. Develop a plan to improve item and test preparation skills through CD&E staff development.

  Dr Nitko arrived in July 1989, examined RTC and CDU operations, met with staff throughout CD&E and the Ministry of Education, and held seminars for RTC and CDU staff. He proposed moving into a system of criterion-referenced testing. His basic message was that teachers look to tests to prioritize their teaching objectives, current tests determine the "real" curriculum that is taught, and what is not tested is de-emphasized in teaching. If CD&E intended that the entire curriculum was to be taught, then certification tests and teacher assessment must be securely referenced to curriculum objectives. Testing and teacher assessments then promote the implementation of the intended curriculum. Continuous assessment becomes supplemental to certification testing, covering curriculum objectives not reflected in certification tests. Dr Nitko prepared three papers: A Summary of Recommendations for Student Assessment, Criterion-Referencing Junior Secondary School Student Assessments, and Steps in the Development of Criterion-Referenced Tests and the Knowledge/Skills Required for Each Step. He began planning a training program at the University of

Pittsburgh tailored for CD&E staff to develop skills needed to implement criterion-referenced testing (CRT). Staff training addressed the needs for:

- Better Test Blueprints

  CRT requires detailed curriculum organization analysis, clearer priorities for objectives to be tested, and test blueprints that reflect a subject's curriculum structure and serve the needs of various stakeholders when reporting test results.

- Detailed Item Specification with Exemplary Items

  CRT requires a wider knowledge of item formats and their applications in various subjects, ability to formulate items for higher order thinking, problem solving, and knowledge application skills; creative use of pictures, graphs, tables, and maps and other supplements; ability to compose distractors; and ability to assess each curriculum objective in different ways. Item specifications are prepared whose components indicate how to write good items; each item specification has a general description, identifies stimulus and response attributes together with supplemental material, and presents an exemplary sample item.

- Changes in Item Writing Workshops

  CRT requires new kinds of workshops for item writers. CD&E staff must acquire the ability to train item writers to use CRT item and test specifications rather than the syllabus alone to create items. They must also learn to identify and select content supplements and to evaluate the extent to which produced items match item and test specifications. Matching test blueprints-test plans-item specifications-written items must be analytic and documentable rather than loosely and subjectively connected.

- Changes in Item Tryout, Analysis, and Selection

  CRT requires a wider knowledge of techniques for item and distractor analysis, how to use this information for revising items, and how to choose items for criterion-referenced tests.

- Different Test Marking and Reporting

  CRT requires a knowledge of standard setting methods to determine passing scores and to set marking levels for criterion-referenced tests, as well as the ability to apply criterion-referenced interpretations and formats when reporting test results to a variety of audiences.

Dr Nitko's second consultancy in 1990 led to hands-on work application of CRT concepts and principles with English, Setswana, art, agriculture, science, and design and technology. Recommendations to implement CRT in each of these subjects were written. Mr Ramatsui, the CEO for CD&E, officially endorsed the move to CRT in all subjects. He then requested and obtained USAID/JSEIP support for staff training to begin at Pittsburgh in January 1991. The first four-month program has just been completed by Serara Moahi, Kathleen Letshabo, and Ndondo Koolese. On their return, they immediately met with senior staff and began planning a CD&E-wide workshop to be held this June. Dr Nitko is now starting his third consultancy during which further implementation of CRT activities and staff training will be carried out.

Current Efforts

JSEIP is directing its testing emphasis on two subjects -- art, and design and technology -- to implement CRT JCE test construction and reporting methods. Art is farthest along, having classified test blueprint objectives, and having developed first versions of a preliminary test plan and item specification forms. Two CRT workshops have been carried out -- one for junior secondary art teachers and one for MCE art lecturers. During Dr Nitko's 1991 consultation, 1990 Art JCE marks were processed and a simulated CRT report of 1990 Art JCE results was prepared. Also, a standard setting exercise with junior secondary art teachers was designed and conducted to help teachers better assess portfolio artwork. Finally, upon the request fof the CEO of CD&E, a paper was prepared which compared standardized and percentage marking for the PSLE.

Upgraded RTC Research Capability

Research should be an institutional component of RTC rather than a mix of "things staff want to do." It needs to be organized with priorities identified, staff assignment to planned projects, stated task responsibilities, systematic action plans, task timelines, and budgets and resources to carry out plans. It needs to become a core rather than a discretionary component of RTC.

The advisor's research was initially focussed on post-administration analysis of PSLE and JCE results. In the longer run, operational research must be extended to the study of test and item characteristics, the possible mix of criterion-referenced tests and continuous assessments in the JCE, the weighting and reporting of domain scores for subject tests, item banking, and other analyses CD&E needs for decision-making.

Research capability has been greatly strengthened with USAID/JSEIP support for CD&E control of computerized test data processing. An early spin-off was analyses that led to the introduction of a series of RTC Research Notes; twenty-four have been written and distributed. Topics relate to test findings; criterion-referenced testing; scoring and reporting procedures, school-level comparisons of achievement on certification tests; limited interpretability of test reports; and weighting of scores.

CD&E in-house control of test data is essential for flexible processing and reporting as CRT becomes implemented. On-the-job staff training has led to routine use of Macintosh programs (other than word-processing) such as Statview, Microfile, and Superpaint. JSEIP has provided four desktop PCs to RTC, first used for data entry in the IEA Reading/Literacy Project directed by an RTC officer. Their use then quickly extended to RTC's analysis of item and test data downloaded from the Government Computer Bureau. Programs now installed and routinely used include SPSS+, dBase, and ITEMAN (item analyses). RTC now has the capability to item analyze all trial item data and to simulate CRT processing and reporting using 1990 test results. The RTC data manager will be trained in the use of these PC application programs for data analysis.

The international IEA Reading Comprehension/Literacy Project is a major research activity directed by a Senior Research and Testing Officer (one of the advisor's counterparts), assisted by the advisor as data manager responsible for developing Botswana's sampling plan for data collection at Standard 4, Standard 7, and Form 2 levels; supervision of coding and data entry by clerical staff; analysis of pilot test results; analysis of test and survey questionnaire data using dBASE/PL, SPSS+, and ITEMAN; and preparation of reports for meetings with the Botswana National Committee.

Staff Development

During the last three months of 1988 and the first three months of 1989, the JSEIP adviser organized a special course in testing for six graduates-with-distinction from the first MCE class. The first three months were spent in small group instruction, and the last three months were spent working with RTC and CDU staff in writing continuous assessment material and participating in workshops. Two of the six are now posted to CD&E as a Research Testing Officer and Curriculum Evaluation Officer, respectively. Three more of the six will soon join CD&E, two in RTC and one in the Examinations Unit.

The most significant staff development input for testing has been the training program conducted at the University of Pittsburgh and carried out through the consultations of Dr Nitko. The first training program has set the course for further training. Implementation of CD&E's CRT policy is foreseen as an exemplary instance of institutional change, and one which may have been delayed without USAID/JSEIP support.

RTC Looks Ahead

Plans for a follow-on project when JSEIP ends this year are being developed by USAID and the Botswana Government. RTC has a stake in whatever this future project's plans might be to continue work in testing and assessment started and realized so far by JSEIP. RTC staff agree on three objectives that implicate its possible involvement with the new project. These are (a) to complete the institutionalization of CRT started by JSEIP, (b) to develop CRT continuous assessment procedures and train teachers in their application, and (c) to consolidate CD&E's capability for in-house processing and reporting of assessment information and its capacity for research activities. A few specifics are listed:

- Institutionalize CRT Certification
  - Establish a complete CD&E-based CRT testing and reporting program.
  - Involve CDU/Examinations Unit/RTC coordinated effort.
  - Extend training started under JSEIP to additional CD&E staff.
  - Facilitate workshop and training sessions carried out by returning trainees.
- Develop Continuous Assessment Models and Materials
  - Coordinate CDU/RTC development of classroom assessment procedures and materials.
  - Develop a body of certification tests x teacher marks validation studies.
  - Centralize continuous assessment processing in CD&E.
- Develop CD&E Data Processing and Reporting Capability
  - Implement in-house, on-line control of test processing and reporting.
  - Train staff in data management and analysis techniques.
  - Assist other MOE units to develop their institutional research capability.
  - Assist in the development of examinations data bases and their merging with other data bases.
- Possibilities for Counselling and Guidance Coordination
  - Expand the aptitude testing program -- using I-D and other aptitude test batteries.

- Carry out aptitude test norming and validation studies.
- Promote usage of I-D or other aptitude tests in job training and pre-job training programs.
- Conduct validity studies of selection measures for TTC and MCE/TCE .

E. CD&E Department Resource Centre (Catherine Powell Miles,JSEIP Advisor)

Introduction

The Resource Centre was established in early 1989 for the purpose of providing officers in the Department of Curriculum Development and Evaluation (CD&E) with the most up-to-date resources relevant to the work of instructional design and development. The centre also provides a central place for access to Ministerial and agency data and documents as well as educational materials produced in the CD&E and other departments in the Ministry of Education. In addition, the Resource Centre provides support of materials development through subject area workshops and computer training.

History of the Resource Centre

The CD&E Resource Centre was established in 1989 to provide CD&E officers and visitors with the most up-to-date resources relevant to the work of instructional design and development. The Resource Centre opened in March 1989 for use by the CD&E staff with a collection of around 1300 titles, most of which were donated by the United States Agency for International Development (USAID), the British Council, local book publishers and other non-government agencies. The Centre was staffed by a JSEIP advisor until 1991.

During 1989, the Departmental Advisory Committee and the Technical Advisory Committee were established by the Chief Education Officer to assist in the organisation and development of the Resource Centre. A needs assessment was conducted by the Resource Centre staff in March 1989 to assess the feasibility and sustainability of the Resource Centre within the CD&E. The results of the study showed a strong need for the Centre as well as a commitment by CD&E officers to support it. The results also provided a base for the formulation of a development plan for the Centre.

The Technical Advisory Committee met in April 1989 and decided on the general floorplan of the Centre and work began on changes in the room to accommodate the plans. Wall-to-wall carpeting was installed to reduce noise, additional shelving for periodicals was installed, and other furnishings were purchased. These included: additional book shelving, periodical shelves, a map file, an audio-tape display case, cabinets for the video collection and other A-V materials, a newspaper rack, a vacuum cleaner, room dividers, desks, chairs, a bulletin board, a large political world map for the wall, and additional file drawers. Equipment that was purchased for use in the Resource Centre include: a computer, a slide-tape projector, a tape recorder, audio-taping equipment, and a multi-system VCR and monitor. Funding was approved in July 1989 for structural changes in the Resource Centre to accommodate the plans for the Centre's use and those have since been carried out.

Beginning in late 1989, educational catalogues, books, periodicals, professional memberships, and audio-visual materials were ordered locally and internationally. Linkages between CD&E and other departments in the Ministry of Education (Primary and Secondary Departments) in addition to other government ministries, educational institutions, and donor agencies have been developed. A brochure which outlines the

resources and services provided in the Resource Centre has been published and is available for users in the Resource Centre. The brochure has also been distributed to other departments in the Ministry of Education. By the end of 1991, a cataloguing and classification system was placed on the computer system.

The Resource Centre is not only serving officers and nonprofessional staff in the CD&E, but it also is used regularly by officers from other departments within the MOE, staff and students from the University of Botswana, teachers and researchers as well as other professionals involved in education in Botswana.

Progress Made

- Materials and equipment in place
  - Books: A collection of approximately 4000 books covering different subject areas and areas such as guidance & counseling, research and educational assessment, materials development, curriculum design, evaluation, teacher training and others
  - Reference materials: dictionaries, World Book Encyclopedia, The International Encyclopedia of Education, Botswana government publications, research publications on Botswana, and donor agency documents
  - Periodicals: A range of approximately 50 local, regional, and international professional journals and newsletters
  - Maps and wall charts: A collection of Botswana maps, world-political, physical and land use-maps as well as posters covering areas such as the environment, population and the different subjects
  - Audio visual materials: A collection of approximately 100 videos covering issues within the Ministry of Education, teacher training, self-instruction on the computer, the environment, and other subject areas; audio-cassettes on English language skills and Maths; and computer software
  - Equipment: Two multi-system VCRs (VHS) and monitors, a slide-tape projector, audio-tape player, language recording equipment, typewriter, Macintosh SE computer, Macintosh IIsi computer with color monitor and CD ROM disk drive.
- Staff Training

  The advisor provided on-the-job training of staff in the development, organization and management of the centre as well as in use of the Macintosh computer.
- Institutionalization
  - Departmental Advisory Committee: This committee includes all six of the unit heads within the CD&E. The Departmental Advisory Committee is responsible for determining the policies and procedures for the Resource Centre.
  - Technical Advisory Committee: This committee includes three CD&E technical advisers whose responsibilities include planning for and overseeing the operations of the Resource Centre.
  - Resource Centre Policy and Procedures Manual: This manual was approved by the CD&E Unit Heads and the Chief Education Officer. It is intended as a guide to the policies, organization, regulations and procedures

of the Resource Centre, and it will also be used for guidance and in-service training of new staff members.

- Classification/ Cataloguing System: The collection is classified under the Dewy Decimal classification system and a data base system has been developed and implemented for the Resource Centre book and materials collection.
- Services offered: Lending of materials to CD&E professional staff, assistance in researching and ordering appropriate materials relevant to departmental needs, individual and small group video viewing, facility for small workshops and seminars, linkages with other educational and government agencies.

Future Plans

Plans are being made to:

- Further expand the services offered and collection of books, periodicals and materials to meet the increasing needs of the CD&E as it continues to develop and expand.
- Subscribe to local, regional and international newspapers.
- Develop linkages with other departments within the Ministry of Education so that information and materials can be better utilized.
- Explore possible linkages with curriculum centres and other educational institutions within the southern African region.

F. IN-SERVICE TEACHER EDUCATION (RICHARD MULLANEY, JSEIP ADVISOR)

Introduction

The current In-service Teacher Education Advisor (ITEA) arrived in Botswana in August 1987. At that time, the Ministry of Education was piloting a project where seven senior secondary school teachers were released half-time to work as in-service advisors in the rapidly expanding network of Community Junior Secondary Schools. The goal of the in-service advisory effort was to work with headmasters and teachers to improve the quality of education delivered to Batswana children. Initially, the role of the in-service advisors was not well defined and was sometimes poorly understood by their clients in the schools. This was natural as the secondary school teaching staff had never had a decentralized support service, and the role of the in-service advisors was often confused with that of the inspectorate. In November, 1987, the Ministry of Education declared that the pilot in-service program was successful enough to warrant an expansion of services the following year. In 1988, the school year opened with twenty-two in-service advisors working out of five decentralized offices located in Maun, Francistown, Selebe-Phikwe, Palapye, and Lobatse. The In-service Teacher Education Advisor, without a counterpart, operated in a line management position developing a decentralized cadre of in-service officers who had little or no training or experience in in-service work. The most important needs for the ITEA to address were: to develop the role of the in-service officers in the Batswana context, to train the in-service officers in skills needed to perform in-service work in schools, to supervise the cadre or in-service officers in the field, and to be an advocate for the in-service cadre in the Ministry of Education so that they could get the recognition, resources, and status needed to do their work successfully.

The Various Active Roles of the In-service Officers

In-service officers spend three or four days each week in schools working with teachers and senior staff assisting them in improving their skills in assessing children and in providing appropriate instruction. Headmasters are always involved in this work in an active effort to develop the headmaster's role as the instructional leader in the school. Most of this time is spent in community junior secondary schools where there is the greatest need, but some in-service officers spend a third of their time in senior secondary schools developing subject departments. Short, focused workshops are held in schools or education centres when the in-service officer identifies common needs that can be best dealt with through workshops. The work of the in-service officers is linked to other activities in the Ministry: in-service training should purposefully build on pre-service education; in-service work must embrace new curriculum developments; in-service work should follow in a school when specific needs have been identified in an inspection report, etc. Since 1987, the following roles have been developed for the in-service officers in their attempts to meet the demands for in-service and staff development work in the schools.

- The In-service Role as the Fire Fighter.

  In a rapidly expanding school system where there are many new schools and a large number of unqualified or inexperienced staff, there are often shortages of basic information, instructional materials, equipment, etc. The in-service officers spend some time assisting teachers with these basic needs and training them in ordering materials, setting up classrooms and storerooms, and in generally preparing for effective teaching. Because they are decentralized, they often assist headquarters in the delivery of materials to the schools or in borrowing materials from one school to use in another. They become involved in advising on how to present content accurately, how to pace the delivery of the syllabus, and how to go about the planning, delivery, and evaluation of instruction. This fire-fighting role for the in-service officers was their first role and continues to be an important one as syllabuses and curriculum change, new schools open, and inexperienced teachers and headmasters enter the system.

- The In-service Role as Surrogate Head of Department.

  The secondary in-service officers have twenty to thirty secondary schools in their regions. As officers become established in the region, they are looked on by teachers, heads of departments, and headmasters as special subject and teacher education resource persons. As they visit their circuit of schools, they can identify areas where teachers need support, can notice when topics are not being taught in sufficient depth, can notice when teachers are falling behind the "norm" rate of progress, and can advise headmasters on ideas and programs that have been observed to work effectively in neighbouring schools. Because of their overview of the subject work, and their experience, they are perceived as the surrogate head of department for the region.

- The In-service Role as the Ministry's Information Agent.

  The in-service officers, by having links with the remotest schools, are important information agents to supply fresh and reliable information about what is going on in the schools to more centralized officers such as curriculum development officers, pre-service tutors, Senior Education Officers, and Regional Education Officers. The in-service officers are the only MOE officials to visit some schools. Because of their school based knowledge, in-service officers are in continual demand to participate in panels, UB INSET workshops, curriculum writing workshops, examination meetings, etc. The officers are also a channel of

information in the reverse direction bringing fresh information about educational policies and practices to the schools.

- The In-service Role as the Professional Coach.

  A more demanding role for the in-service officers, initiated in 1989, is that of the role of consultant and "coach" to school staff. The coaching role requires that the in-service officer gains the trust of school staff, negotiates with them about entry into classrooms, and jointly plans and teaches lessons. The officers work collaboratively as consultants and professional colleagues with the teachers. Much of the ITEA's staff development work with the in-service officers has been to train them to acquire coaching skills and to follow up this training with supervisory work with them in the schools. A series of five trainer-of-trainer workshop modules have been developed for the in-service officers with the assistance of ODA consultants. These "coaching the coaches" workshops allowed in-service officers to acquire basic consultant skills such as to:

  - establish open, supportive, and cooperative relationships,
  - interview school staff to assist them in identifying their professional strengths and weaknesses and, with them, to identify areas where they need and want in-service training,
  - assist teachers to develop an in-service plan of action,
  - effectively observe teachers at work and provide appropriate evaluation and advice, and
  - train staff to evaluate their teaching by examining student attainment.

- The In-service Role of Promoting Instructional Leadership in the Schools.

  Good instruction should begin by assessing the students present attainment levels, study skills, etc. Differentiated instructional materials can be created to deliver the curriculum in a manner best suited to effectively meet all students needs. These sorts of tasks are often not done by busy teachers. The in-service officers can promote such activity by working with the headmaster and teachers to develop school policies on student assessment and differentiated instruction. These policies can form the basis for a school development plan which includes a scheme for staff development in the school. In 1990, in-service officers were trained to assist school staff to construct a school development plan in a two step process:

  - conduct a school self-evaluation of what assessment and instructional practices now take place in the school, and what is known about: student attainment and diversity, staff experience and instructional expertise, school instructional resources, staff training needs such as those driven by curriculum change, etc.;
  - assist the staff to create a school action plan which would establish: assessment and instructional priorities, an agreed on set of obtainable targets, a set of assigned tasks for each member of staff, and a set of criteria for measuring success through an evaluation scheme;

  The creation of a school development plan has many obvious advantages:

  - it focuses attention on the aims of education and especially the learning and achievements of all students;
  - it captures the school staffs long-term instructional vision for the school within which manageable short-term goals are set;

- priorities and policies are set which allow the headmaster to effectively play the role of instructional leader in the school;
- stress on teachers caused by the pace of change is relieved;
- achievements of teachers are recognized so as to increase confidence and promote innovation;
- the quality of staff development is improved because in-service work is now appropriately servicing needs and wants that the school staff have identified that they wish to have as part of their own professional development; and
- the school will have a Development Plan which will serve as a basis for school reports, inspections, relations with the local community, and year by year growth and continuity.

- The In-service Role as Facilitator of Whole School Workshops.

  In 1987 and 88, the in-service officers found it difficult to play a generalist's teacher education role and were instead limited to what they knew best, their particular subject. As they matured in in-service work, they became confident to work with any teacher who required assistance regardless of what subject the teacher taught. It became apparent that many problems that teachers face are generic to the teaching profession. The in-service officers began in 1990 to create and deliver whole school workshop modules on cross-curricular issues. Modules which have been requested by schools include: mixed attainment teaching methods, varying school instructional activities, techniques for assessing student attainment, setting useful study work, organizing teaching resources and making instructional materials. Whole school workshops provide indirect benefits such as assisting in melding the teachers in a school into a mutually supportive instructional team with the headmaster as the instructional leader; placing responsibility for post-workshop support on members of the school staff which builds an in-service support system with-in the school; and motivating school staff to take more control of their own staff development according to their local needs. In 1991, the in-service officers are supporting very remote schools with whole school workshops as these schools can only be visited infrequently.

- The In-service Role as Workshop Designer and Facilitator.

  There are additional roles, of course, that the in-service officer plays. That of the designer and facilitator of effective workshops is one. Workshops in Botswana have a history of being very formal, where people are invited to "read papers" that are then discussed. In our staff development workshops for the in-service officers, we use an experiential model where participants come to the workshop with a teacher or headmaster that they have worked with closely. The workshop is focused on the reports of the actual in-service work that is on-going in the schools and a framework is provided to reflect on the work and share experiences. New material is introduced and practiced in small group activity. These "coaching the coaches" workshops are meant to model good workshop design and conduct.

In the latter part of 1991, the secondary in-service operation moved to the Department of Teacher Education. One advantage of this move is that the secondary in-service officers are in the department that supervises the education centres. We expect that some of the officers will become education centre directors and this will assist in integrating the primary and secondary in-service efforts. Also a counterpart for the ITEA has been appointed and the ITEA's contract has been extended until April, 1992

to provide a "bridge" between JSEIP and the Basic Education Consolidation (BEC) Project. Much of that time will be used for on-the -job training of the new In-service Teacher Education Officer.

G. MCE Department of Design and Technology (Frank Walton, JSEIP Advisor)

Background

The Ministry of Education (MOE) established Molepolole College of Education (MCE) to prepare teachers for the Community Junior Secondary Schools (CJSSs). The opening of MCE in 1985 coincided with the significant expansion of the secondary education program. This expansion was concerned with providing a universal nine year basic education to the youth of the nation. As of January 1985, there were four teacher training colleges preparing teachers for the primary schools, the first seven years of the basic education program. With the establishment of the continuously increasing numbers of CJSSs, the establishment of MCE became necessary, as the University of Botswana could not meet the demand for secondary school teachers.

One of the contributions of the Junior Secondary Education Improvement Project has been the provision of an advisor for Technical Studies at MCE. The advisor arrived in January 1986 and began the process of establishing a department at MCE. His job was (a) to prepare teachers to teach Technical Studies at the Community Junior Secondary School level, and (b) to facilitate the production of teaching aids as needed by lecturers and students at the college.

When the college opened in February 1985, the teaching subject offerings were limited to Setswana, English, Mathematics, Science, Home Economics, and Social Studies. The programs offered at the college were constrained by the availability of staff. The same pattern of staffing needs at MCE was also reflected in the CJSSs; therefore, there was some urgency for the establishment of the Department of Technical Studies. The advisor spent the first two months assisting in the Education Department at the college and in developing some background into how Technical Studies was defined in Botswana, the extent of its offerings at the different levels of the educational continuum, the factors that would affect the establishment of a department at the college, the needs in Botswana with respect to Technical Studies, and the problems that could be anticipated.

The following issues were considered when addressing the task at hand:

1. With the exception of the Auto Trades Training School and the Brigades, most of Technical Education was in the British mould and under the supervision of British personnel.
2. The programs at the senior secondary schools, with one exception, were limited to woodwork and technical drawing. These were done as single subject, skill-oriented programs, and were taken as single subjects at the Cambridge Overseas Examination level. Invariably, students did only one of these subjects.
3. At the CJSS level, an attempt was being made to run an integrated program of technical drawing, woodwork and metalwork. The term Technical Studies was used for this integrated program. The CJSS's program was different from the senior secondary school program in that all components of the program were meant to take place simultaneously in a single room with limited equipment. Most of the teachers were experiencing severe difficulties with this new program.

4. The senior secondary schools write the Cambridge Overseas examination and the junior secondary schools write the locally based Junior Certificate Examination upon completion of their respective programs of study. It appeared that the new CJSS Technical Studies program was merely the first years of the senior secondary program and did not appear to address the fact that completion of the Junior Certificate represented the terminal, formal education point for approximately 60% of the students. From an historical perspective, this is understandable because, prior to the Nine Year Basic Education Programme, the Junior Certificate Examination was a part of a five year secondary education program.

5. There was no locally available preservice or inservice program to prepare teachers for the desired CJSS technical studies program.

6. Decision-makers were not fully aware of the kind of support required to set up a Technical Studies teacher training program at MCE.

7. Decision-makers did not fully understand or appreciate the benefits of the program.

8. Parents had the expectation that the program would provide vocational skills, as opposed to technology exploration.

9. The MCE program needed to take into account Botswana's technical manpower needs and increase the standards by which acceptable craftmanship was judged.

In view of the government's stated educational policy and the aims of the Nine Year Basic Education Programme, there was need for a wide spectrum of coordinated development activities in the subject. In order to provide a context for all developments related to Technical Studies, a philosophy paper was developed by the advisor. That document has since served to give direction and cohesion to curriculum development, teacher training, program organization, and management.

Molepolole College of Education

The college offers a three year secondary teacher diploma program. In 1986, the intake of the college was 160 and each student was required to study two main subjects for the duration of the program as well as two subsidiary subjects in the first two years. The college now takes in approximately 220 students annually. Students still do two main subjects, but the subsidiary subjects have been replaced by communications and study skills in the first year and an elective in the second year.

The college calendar runs from January to December. When the advisor arrived, students were already settled in their programs and there was no plan for the immediate establishment of Technical Studies. However, there was a provision in the college's program for a limited number of students to change courses. The advisor and the newly arrived art lecturer took advantage of this provision and combined forces to establish the Department of Art Craft and Technology (ACT) in March of 1986. There were several similarities in the proposed Art program and the proposed Technical studies program. These similarities coupled with the Ministry of Education's interest in integration was one of the main reasons for combining the two subjects.

In April of 1986, 18 students enrolled in ACT as a main subject and another 40 took it as a subsidiary subject. During the first year of their program, students were required to take an even amount of art and technical studies; during the second and third years, they specialized in one of the two subjects. While this meant small classes in years 2 and 3, it was thought advisable to start small because of insufficient staff and resources. This arrangement lasted for 2 intakes (1986 and 1987) but limitations of time, coupled

with the fact that very few students who entered the program had any background indicated a need for change.

In 1988 Art and Technical Studies became separate departments. Consistent with widespread desire for change, Technical Studies changed its name to the Department of Design and Technology (D & T). Although the change in name did not mean a corresponding change in the program at the CJSS level, it was a position that the advisor vigorously supported because the new name better represented the program as one which would address Botswana's needs and the proposed program at the college. In both its original and present structure, Department of D&T has been under the leadership of the advisor, from its inception to December, 1991.

The Department of Design and Technology / MCE

The primary function of the department has been the preparation of teachers for D&T in the CJSSs. Secondarily, the department facilitates the development and production of teaching and learning aids. The following discussion provides a description of the development and activities of the department under these categories: Facilities, Tools and Equipment, Staff, Preservice Training, Inservice Training, Linkage with the Curriculum Development Unit, and Concepts Introduced to Botswana.

- Facilities

  When the department began operations in April of 1986, the D&T teaching facility was an enlarged conventional classroom, not suitable for the majority of activities in the D&T program. This limitation probably resulted from the fact that when the building was built, decisions about the nature and purpose of D&T had not been finalised. In February of 1987, the building earmarked for Teaching Aids Production (TAP) was completed. The design of that building for the making of teaching aids was also much more appropriate for design and technology education. Since the types of activities for D&T and TAP were similar, and since both programs were headed by the same individual, a decision was made to combine operations. The large classroom became known as the Craft Room and the TAP building as the Technology Lab. These facilities were equipped in such a way that both programs could share them according to the nature of the activity.

  Because of increased enrollments over the years, the department has outgrown the present facilities and lecturers are anxiously awaiting additional ones. Both the Craft Room and the Technology Lab are used on an average of 40 hours each per week as of January 1991. Additional space is required now and the demand will be even greater in 1992.

- Tools and Equipment

  The building and equipping of the college was done as a unified project and many problems resulted from this type of arrangement. The selection of the tools and equipment provided for the D&T program had been based on the woodwork and technical drawing programs at the senior secondary schools. These tools and equipment were never properly inventoried or managed. The inventory made by the head of department (HoD) on his arrival did not match that of the supplying agency. The matter was never properly resolved in that no one could account for the discrepancies. The non-resolution of the matter severely hampered the program during its first two years of operation because no additional tools could be procured.

  The early problem with tools and equipment naturally had an effect on the students. Fortunately, USAID/Botswana provided MCE with a generous

emergency grant to remedy the situation. Since the time of those early problems, the department has become well supplied with an assortment of tools and has the capacity to offer the teacher education program, using a variety of materials, tools, and processes in such areas as technical graphics, photography, screen printing, model making, woodwork (hand and machine), metal work (hand and machine), plastics, masonry, energy, mechanisms, and structures.

- Staff

  Design and Technology started out as a one person department comprised of the advisor. He established the department in 1986 and continues to serve as its head. In the years since 1986, additional staff have been provided, but none with teacher training experience nor extensive secondary teaching experience.

  Because citizen staff is limited in training and experience, a staff development program was initiated by the advisor in an attempt to identify potential lecturers and to provide some exposure to new approaches to Design and Technology for Botswana. One staff development fellow at the college received a first degree in England in 1991. Another has been recommended for further training with a view that he would return to serve at the college. Because of the limited number of degreed Batswana, the present staff development program needs to be expanded.

- Preservice Training

  Over the years, the program has had to straddle two fences. Changes in the CJSSs have been slow because of manpower shortages to effect the changes. At the college, it has been necessary to assess present and future needs and to prepare a teacher that is both capable of carrying out the present program and capable of coping with the emerging changes in the program. The present program in the CJSSs is a skill based one. The emerging program, while maintaining an appropriate knowledge/skill base orientation, is a technology exploration program.

  As mentioned earlier, resource deficiencies constrained the size of the operations in the early days. However, there has been a systematic expansion, and it is anticipated that in 1992 we will have the capacity to cater to 120 students, 40 in each year grouping. Desire and suitability of the candidates is an additional variable in the expansion of the department. With more students having the opportunity to take D&T at the secondary school level, it is anticipated that the goal of an intake of 40 students per year will be realized.

- In-service Training

  During the years 1986, 1987, and 1988, the department offered in-service programs to approximately 40 teachers per year. These in-service programs lasted a full week and were conducted during the school vacations. The thrust of these programs was the organization, management, and development of resources for teaching D&T as a multiple activity program at the CJSSs. This function has now been taken over by a team of Field Education Officers (FEOs).

- Linkages with the Curriculum Development Unit (CDU)

  Until January 1989, there was no Curriculum Development Officer (CDO) for D&T. With his arrival in 1986, the advisor had involved himself, informally, in the curriculum development process for the CJSS program. This involvement took a more structured approach in 1988 and resulted in the recruitment of a teacher to serve at the CDU, first as a materials development team (MDT)

member and subsequently as the CDO. Together the advisor and the CDO set in motion the process of curriculum change in D&T, from a skill based woodwork, metal work, and technical drawing program to a technology exploration program. The philosophy paper, referred to earlier, has served as the cornerstone for this new program. To aid in the process of curriculum development for the junior secondary program at the CDU, two short term consultants were recruited through JSEIP in 1989. These consultancies resulted in a greater focus on how to revise the curriculum in accordance with the new philosophy. In 1990, one of the consultants returned to Botswana as a full-time curriculum advisor to work with the CDO in developing the materials required for the new program. MCE and the CDU continue to be linked in the development and refinement of this new D&T program.

- Concepts Introduced to Botswana

  Based upon his assessment of the needs of the D&T CJSS program in Botswana, the advisor introduced the following management and organizational concepts:

  - Multiple Activity Lab or Classroom (MAL or MAC)

    A multiple activity lab is an arrangement whereby several different student activities, using a variety of materials and processes, are going on simultaneously in an organized, non-chaotic manner. It facilitates a technology exploration program being carried out without a large inventory of tools and equipment. Under this arrangement, the teacher, instead of being the fountain of all required knowledge and the one who solves problems, assumes the role of a manager of a practical learning laboratory.

  - Learning Activity Package (LAP)

    A LAP is a written educational resource that guides a student or a group of students through a co-ordinated series of learning experiences. It usually has a practical component to it.

  - Work Stations (WS)

    A work station in the D&T lab is an area set up to allow a specified activity or set of activities to be economically and effectively carried out in terms of space, time and resources.

  - Student Management System (SMS)

    A SMS makes the learner take on some of the responsibilities for managing his/her learning environment.

  - Student Information System (SIS)

    A SIS is based upon (a) the teacher stimulating in the minds of the students a need "to know," (b) the availability of information in an easily consumable form, and (c) the teacher not providing all the solutions to students' problems. Under these conditions, students can and will find out for themselves, using the convenient provisions organized by the teacher.

H. MCE Department of Education (Johnson Odharo, JSEIP Advisor)

Introduction

From 1985-1988, the activities of the MCE education advisor were broadly defined to include 50% time at the Molepolole College of Education (MCE) and 50% time at large

for general curriculum development activities at the Ministry of Education. For almost two years (1987-1988), his general curriculum development activities included the development of a syllabus and materials in Agriculture for the junior community secondary schools. Owing to the problems associated with performing dual responsibilities and other reasons, the advisor's terms of reference were redefined in 1989 with a primary emphasis on pre-service education although he continued to help the Physical Education and Home Economics Panels to develop their syllabuses for pre-service education, secondary school teachers and the Nine-Year Curriculum. Therefore, the following summary has been divided into two broad areas: Pre-service and General Curriculum Development Activities.

Pre-Service Education - The MCE College of Education

The Education Department

Prevailing Conditions. When the advisor assumed his position at MCE in 1985, the Education Department was teaching a curriculum for the three-year diploma in junior secondary education. At that time the college was only a year old and had 175 students. None of the three lecturers in the department, all expatriates, had curriculum development experience. The curriculum consisted of six courses: (1) Introduction to Education; (2) Principles and Practice of Education; (3) History of Education; (4) Educational Technology; (5) Educational Administration and (6) Philosophy of Education. Each of the above courses included a textbook bearing the same name and the course outlines followed the chapter headings of the prescribed textbook.

Learning resources were lacking and teaching was primarily based on class lectures and class textbooks.

Contributions. Much of the advisor's time and energy has been devoted to making the Education Department a model to other departments. Since joining MCE, he has been appointed Head of Department and has been given the responsibility of reorganising the entire college curriculum. Some of his contributions are described below.

- Philosophy of the Department - The advisor introduced the concept of embodying philosophy to provide the rationale for determining the knowledge, skills and attitudes students should demonstrate upon successful completion of the program.
- Course System - A course system was introduced addressing various competency areas as implied by the philosophy. Twelve courses were introduced for 9 terms of 12 weeks each, that is, 5 full courses and 7 half courses. Full courses were based on major skill areas such as Instructional Design, Test Construction and Continuous Assessment. Half courses were based on supportive knowledge and skill areas such as Teaching Aids Production, Educational Administration and Philosophy of Education.
- Course Organisation - The advisor introduced a systematic approach to course organisation and layout. The curriculum was designed with fixed running heads for presenting the array of courses offered in the department. The format consisted of course title, description (including general objectives) and topic outline. Each course was further developed with a format in which each topic area had objectives, learning activities including resources, evaluation strategies and references.
- Special Courses - Two major courses which departed from a traditional approach to teaching and learning were introduced. Instructional Design, using self-instructional modules, was introduced with a focus on employing contemporary

learning theories and strategies in designing teaching-learning activities. It was a departure from the traditional way of teacher preparation because of the emphasis on helping the teacher to think systematically and yet integratively about how best to provide effective and efficient instruction. To date, about 800 students (now certificated teachers in the field) have successfully taken the course of instructional design. The Teacher Education course was introduced in 1989 to focus mainly on attitude development. The course is broad-based covering topic areas such as regulations governing the teaching profession, rights and responsibilities of the teacher, professional growth and development opportunities, public expectations, personal discipline and coping mechanisms.

- Course Delivery Methods - The advisor introduced the concept of 30/70 (theory/practice) in which 70% of instructional time should be used to provide practical experience to the student. To achieve this, games, simulation exercises, classroom observation, micro-teaching, peer-teaching, inquiry methods, tutorials and learning groups should be an integral part of all courses. In all courses, continuous assessment should be a major tool of mastery learning and a vehicle for monitoring student progress.
- Courses Taught - Apart from helping to develop courses, the advisor has taught the following courses: Instructional Design, Curriculum Design, Test Construction and Continuous Assessment, Learning Theories, Teacher Education, Mixed-ability Teaching, Classroom Management, Teaching Aids Production and Human Growth and Development.
- Instructional Resources - With funding from JSEIP, Instructional Design textual materials (about 200 volumes) were acquired including a journal subscription (paid by the college).
- Inservice - Educational Seminars were introduced by the JSEIP team in 1988 as a means of information sharing among lecturers on general and specific pedagogical issues such as the role of instructional objectives in teaching and accountability. Departmental workshops such as computer skills, instructional media and teaching methods were periodically organised and conducted by the advisor to strengthen instructional capability of lecturers in the Education Department.
- Department Organisation - One of the main expectations of the advisor as head of department was to improve the image of the department in helping lecturers to become more productive. The department has been re-organised and various responsibilities in the following areas have been distributed among the lecturers: (1) course leaders; (2) department instructional resources; (3) department records; and (4) course coordinator who is the liaison between the department and subject departments. The advisor embarked on a recruitment drive in April 1990 thus increasing the staff strength from 7 in 1990 to 12 in 1991 (including 2 staff development fellows).

College-Wide Activities

Prevailing Conditions. The college was only eight months old when the advisor arrived on post. As a new college, many of its features were still in the developmental stages and a number of its basic features were lacking. For example, there were no department heads. Departments were administered by coordinators who were employed as lecturers, some of whom were recruited from secondary schools. Many departments were still formulating their program of studies and each department operated in isolation as there was no central philosophy and coordination of programs among departments.

Contributions

- Curriculum Evaluation and Coordination - The advisor chaired the committee which evaluates and coordinates the professional studies and common topic areas of the college curriculum. That committee has successfully coordinated common topic areas of subject departments with courses offered by the Education Department. Here courses are offered in a sequence that permits general principles taught in the foundations of education to be applied in the subject departments. In addition, common practical exercises are shared and supervised by lecturers in both the subject and education departments.

  The committee has produced a common scheme of work and lesson plan formats to be used for preparing teachers for teaching practice. Follow-up studies of past graduates have been conducted by the committee to provide data for improving the college curriculum.

- Curriculum Framework - A common curriculum layout format (adopted) and course outlines (under review) were suggested by the advisor. The purpose is to lay the foundation for producing a catalogue that represents the academic program of the college. A central philosophy of education to be included in the catalogue has been developed.

- Admissions - The advisor has helped in formulating guidelines for admissions and interview procedures for selecting candidates for the college. Previously, interviews were conducted with limited guidelines, thus creating a disparity between interview panels.

- Inservice - Since the cancellation of the Education Seminars (due to time-table change), staff development activities of the college have been limited. However, the advisor organised and conducted courses in computer skills to interested lecturers.

- Curriculum development - Contribution towards development of subject department curriculums has been limited for various reasons. However, the advisor helped the Physical Education Department to layout its program of studies. Relationships with other departments remain informal, though the current leadership has recognised the necessity to have a formal coordination among departments.

<u>General Curriculum Development Activities</u>

As indicated earlier, for a brief period, the advisor's time was shared between MCE and the Ministry of Education to permit involvement in the nation-wide curriculum development effort. Following is a summary of the advisor's involvement.

- Agriculture Education - The advisor helped in developing the syllabus and laying the framework for materials development for the junior secondary schools. The effort involved working with the subject panel in conducting nation-wide workshops and supervising writing teams.

- Home Economics - In this subject, involvement was limited to the Primary Teacher Training Colleges. The advisor helped the panel to develop a common curriculum. Previously, each college taught the subject using materials for the junior certificate program. Current effort was based on needs assessment which outlined areas of central focus. The layout is objective-based with specific reference to learning materials, teaching methods and evaluation that includes continuous assessment.

- Physical Education - The advisor provided expertise and helped in coordinating the development of a comprehensive curriculum of Physical Education for the Nine Year Basic Education Programme including the two-year junior certificate program. The advisor was a member of the National Panel and has worked with selected members. The two-year junior certificate program has been piloted.

I. MATERIALS DESIGN AND PRODUCTION (BARRY VOGELI, JSEIP ADVISOR)

Background

When JSEIP began in 1985 the Curriculum Development Unit (CDU) had no in-house capacity to design and produce the print materials (syllabuses, texts, and teacher's guides) that were to be developed by the Project. The CDU lacked the equipment, staff and space for the design and production of such materials.

The production equipment possessed by the CDU at that time consisted of one electric typewriter, two manual typewriters, one desktop photocopier, one manual paper cutter and a few staplers. The unit had no computers and no staff who were trained to use computers. There was no production staff and the rented quarters that the CDU was occupying were cramped with little room for expansion. Thus, JSEIP started to build a materials design and production capability at the CDU starting virtually from scratch.

Under JSEIP a central building was constructed for the Curriculum Development and Evaluation Department (CD&E), of which the CDU was a part. Previous to the construction of this building the Department had been completely fragmented with the various units housed in different locations throughout Gaborone. The new building, which was completed at the end of 1987, has been a very important factor in the unification and advancement of the CD&E Department.

For the first two years of JSEIP, while the new CD&E building was under construction, the production capability of the CDU remained constrained due to the continued lack of space and staff. While five posts for production staff were requested by the CDU in the early months of the project, by the time the new building was occupied no permanent production staff had been hired. It was three years into the project before three permanent production posts were established and filled. Four years into the project a counterpart was assigned to the advisor responsible for materials design and production. Therefore, it was only in the latter half of the project that staff and facilities were available to develop the required print production capabilities for the CDU.

Development of Capabilities

The acquisition of equipment for the design and production of materials were phased over the life of the project according to expanding needs and dependent on the availability of space and staff to utilize the equipment. In particular, this phased procurement of equipment enabled the project to remain up-to-date in the rapidly changing field of desktop publishing - a major area of development for the CDU.

Word Processing and Desktop Publishing

While the CDU still occupied its old quarters, the first computer equipment was installed. It consisted of two Macintosh 512K computers and a Laserwriter printer. Training for staff began immediately upon the installation of the equipment. Two curriculum officers and three copy typists were given on-the-job training on the Macintosh computers in word processing with Microsoft Word and page layout using PageMaker.

With this equipment and training the CDU was able to begin to design and produce a variety of materials. While most of the early efforts involved reports and syllabuses, camera-ready copies of two teacher's guides for mathematics were soon prepared by the CDU. These guides, which were sent directly to the printer for mass production, represented the CDU's first significant undertaking in desktop publishing.

From this beginning CDU has progressed to the point where it now has over twenty-two computer users of varying capabilities. Every curriculum officer and every typist in the Unit can use Microsoft Word on a Macintosh computer for word processing and some have also developed skills with other applications. JSEIP has provided the Unit with sixteen Macintosh Plus and SE computers which are used primarily for word processing.

In addition to the word processing capabilities, JSEIP has developed advanced desktop publishing capabilities at the CDU by providing state-of-the-art hardware and software. The Design and Production Section of the CDU presently has seven Macintosh II computers and two laser printers which are exclusively used for desktop publishing. Four of these computers have large two-page monitors to facilitate page layout and another has a high resolution color monitor for graphics work. The Section also has two scanners which can transfer both printed text and graphics to the Macintosh for editing and use in documents. Two of the most recent equipment acquisitions have significantly advanced the section's desktop publishing capabilities. The first of these is a color video capture board which enables the Macintosh to capture images from TV, a video camera or a video tape to be used as photographs in print materials. The second is a board and software combination which increases the print resolution of a LaserWriter from 300 dots per inch to 800 dots per inch, thereby providing very high quality type and graphics. Thus, the CDU now has a full complement of equipment to prepare high resolution camera-ready master copies of instructional materials for mass production by appropriate printers.

Print Production

At the beginning of the project a U-Bix 500Z photocopier and an electric stapler were purchased for the production of print materials. The copier had a print speed of 50 copies per minute and also had double-sided printing and collating capabilities. A one week course on the operation and maintenance of the copy machine was conducted by the vendor when it was installed. For a time the U-Bix photocopier was sufficient to handle the limited printing needs of the CDU, however, a growing demand for print materials soon exceeded its capacity.

The completion of the CD&E building provided the space necessary for the expansion of the reproduction facilities for CDU. After a number of different equipment options were explored, the Ministry of Education purchased a Xerox 9500 printing system for the CDU as a part of the GOB contribution to the project. This system consisted of a 120 copies per minute xerographic printer with an automatic document feeder, double sided printing, and a fifty bin collator. For binding printed materials a Hohner wire stitching machine was purchased. With the addition of this equipment the Design and Production Section has been able to develop an adequate capacity to produce print materials, not only for the CDU, but for the entire CD&E Department. At present, the Production Section prints approximately 125,000 pages per month for the Department which includes reports, newsletters, forms, syllabuses, texts, teacher's guides, and tests, and the demand is still increasing. However, even with this greatly increased capacity the CDU must still rely upon the Government Printer and local publishers for the mass production of instructional materials for country-wide use.

Audio-Visual

While not actively engaged in the production audio-visual instructional materials the CDU has acquired some basic audio-visual equipment to support the curriculum development and training efforts of the Unit. JSEIP has provided several video cameras, recorders, and monitors; audio recorders and amplifiers; a slide projector; and a 16mm film projector. While all of this equipment was originally purchased for demonstration and training activities, the video equipment is now able to be interfaced with Macintosh computers to expand desktop publishing capabilities.

Staff and Training

Sufficient staff trained to effectively use the equipment available is certainly as important as the equipment itself. From the beginning of the project until the present time, the Design and Production Section has been understaffed. Naturally, the lack of adequate staff has greatly hindered the training program and delayed the development and implementation of effective production procedures and processes. At present the only component of the Section that is adequately staffed is that of printing. In this area there are now three machine technicians, two of which were appointed within the last year. Some additional training is planned for these technicians.

In the area of desktop publishing two well qualified technicians were hired and trained early in the project, but after working at the CDU for several years both left for better paying jobs. Now these posts are occupied by technicians that lack the basic qualifications required by the job description. This severely limits their capacity for training and, therefore, their ability to perform to the required level. The problem with the desktop publishing posts seems to be that they are not at a high enough grade to attract and retain qualified technicians.

Some very important areas in the Design and Production Section do not yet have posts established. These areas are in graphic arts, editing, and audio-visual materials. Posts in these areas must be established and filled before the Section can reach its full potential.

The CDU Media Officer who is the head of the Design and Production Section returned to the CDU in September, 1991 after completing a Masters Degree in Instructional Technology at Southern Illinois University (Edwardsville) in the United States. His return has contributed greatly to the materials design and production potential at the CDU.

J. JSEIP/IEES Educational Research (Wes Snyder, JSEIP Advisor)

History

In early 1977, the National Commission on Education carried out the first comprehensive evaluation of the education system since Independence. Based on wide participative consultation throughout the country, recommendations for the future of education were developed, contained in the report Education for *Kagisano*, and accepted by Government, as translated into national policy by the National Assembly in late 1977. The Commission was reconstituted in 1979 to assess progress on the implementation of the plan. Thus, there has been a clear strategic thrust to development efforts in education for the past decade and a precedence for gathering information, formative feedback, and policy adjustment to effect educational development.

A more recent set of assessments of the education system was carried out by the Ministry of Education (MOE) through the IEES Project. The initial report, *Botswana Education and Human Resource Sector Assessment* (1984; updated in 1986, with

addendum each year), led to the JSEI Project (1985), targeting the junior secondary subsector as a priority area. The IEES Project has remained linked to the Planning Unit in the Ministry of Education and continued to work on the generation of timely system information for the managerial level of the ministry and the long-term maintenance of relevant databases for system planning and policy analysis. JSEIP has been linked primarily to the Deputy Permanent Secretary's Office and the Department of Curriculum Development and Evaluation, less directly to the new Department of Teacher Education, Department of Secondary Education, and Molepolole College of Education, and peripherally to the Department of Primary Education, Primary Teacher Training Colleges, University of Botswana, and the new Tonota College of Education. The information needs addressed are departmental, programmatic, or substantive. These two closely related projects promote and encourage research and routine information maintenance from the system level down through specifics of content and method issues for the classroom.

Research Areas

Research in JSEIP and IEES has been guided by the Commission and General Assembly arguments for educational development. Their recommendations have set in motion rapid system growth, vast structural changes, and new and innovative instructional developments. The research provides rich description and thoughtful reflection to inform policy assessments and adjustments. The following selected papers provide some indication of research scope.

Systemic

Most of the work dealing with general system issues is handled by the Planning Unit of the MOE. Staff members of the unit are seconded to the MOE from the Ministry of Finance and Economic Planning. Their brief is to provide information for efficient program planning and development across the various professional departments. The IEES Project has played a prominent role in these endeavors and the supportive training necessary to develop the capability of the unit. The papers below reflect the ministry-wide concerns of the Planning Unit; current efforts are focused on the development of the education section of the National Development Plan 7.

Burchfield, S. A. (1990). *Educational Planning Projections*. Gaborone, Botswana: Planning Unit.

Hartwell, A. S. (1988). *Systems Development: Activities and Products for the Botswana Ministry of Education Planning Unit*. Gaborone, Botswana: JSEI and IEES Projects.

Noel, Kent L. (1991). *Instructional systems development and curriculum change in Botswana* (in press). Journal of Educational Technology Research and Development, 39(3).

Snyder, C. W., Jr., & Nagel, J. (1988). *Indicators of Quality in Botswana Primary Education*. Gaborone, Botswana: IEES.

Windham, D. M. (1988). *Improving the Efficiency of Educational Systems: Indicators of Educational Effectiveness and Efficiency*. Tallahassee, Florida: IEES.

Departmental

The Department of Curriculum Development and Evaluation was created by the National Commission. JSEIP was designed to assist in the institutional and professional development of this department. Research in this area has focused on the

organizational issues entailed in both internal development and external lateral links of the department with other facets of the Ministry and school system.

Allen, P. J. (1989). *Policies Guiding the Department of Curriculum Development and Evaluation*. Gaborone, Botswana: JSEIP.

Burkman, E. (1990). *Suggested Guidelines for Syllabus Development and Formative Evaluation*. Gaborone, Botswana: JSEIP.

Meyer, J. W., & Nagel, J. (1989). *Policy and Organization in Curriculum Development in Botswana*. Gaborone, Botswana: JSEIP.

Nagel, J. (1990). *Organizational Issues in Curriculum Development in Botswana: A Follow-up Report*. Gaborone, Botswana: JSEIP.

Snyder, C.W., Jr. (1990). Affective Context of Schools as a Potential Indicator of Teacher Receptivity to Instructional Change and Teacher Worklife Quality. In D. W. Chapman & C. A. Carrier (Eds.), *Improving Educational Quality: A Global Perspective*. New York: Greenwood Press.

Student Reports from the Florida State University/University of Botswana joint Masters Program. (1988). *CJSS School Descriptions and Attitudes to the Nine Year Educational Programme*.

Wonderlich, B. L. (1990). *Putting Together the Integration Puzzle*. Gaborone, Botswana: CDU, Peace Corps, and JSEIP.

Programmatic

The *Nine Year Education Programme*, as proposed by the National Commission, was initiated in earnest about 1983, after appropriate infrastructure was in place or under development. Based on extensive consultation, this program entailed wide-ranging instructional changes to meet the expectations of the public and to render the curriculum more 'relevant' and 'practical.' IEES sponsored University of Botswana research to examine the policies and practice of community consultation in Botswana education, and JSEIP helped to organize a national consultative conference series to provide feedback and continuing information from the various relevant constituencies concerned with implementation of the program.

Cownie, D., & Ives, L. (1990). *Art Education and Art Employment Research Survey*. Gaborone, Botswana: SIAPAC and JSEIP.

Davis, R. (1987) *Reading Comprehension Study*. Gaborone, Botswana: JSEIP.

Davis, R. (1988) *"The Poor Boy Cannot Read," Some Results of the Nees Assessment of English Language Proficiency Project*. Gaborone, Botswana: JSEIP.

Meyer, J. W. (1990). *Community Concerns: Public Expectations and Educational Development in Botswana*. Gaborone, Botswana: JSEIP.

Molutsi, P. (1989). *Strengthening Local Education Capacity Through Community Involvement*. Gaborone, Botswana: University of Botswana and IEES.

Robb, J. (1990). *Design & Technology: A Curriculum for the Community Junior Secondary Schools of Botswana*. African Regional Workshop on Technology Education, Nairobi, Kenya. February 19-23, 1990.

Robb, J. (1991) *Technology Education in Botswana*. International Technology Education Association Conference, Salt Lake City, Utah. March 17-21, 1991.

Robb, J.L., Peleowetse, T.M. and Walton, F.C. (1990) Practical Curriculum for Emerging Technology. In C.W. Snyder, & P.T. Ramatsui (Eds.), *Curriculum in the Classroom: Context of Change in Botswana's Junior Secondary School Instructional Programme*. Macmillan Botswana Publishers, Gaborone, Botswana.

Snyder, C. W., Jr. (Ed.). (April, 1988). *Therisano Ka Thuto: Community Consultation on Basic Education for Kagisano*. First Conference Proceedings. Tlokweng, Botswana: Ministry of Education. And Noel, K. (Ed.). (September, 1988 and April, 1989). *Therisana Ka Thuto: Community Consultation on Basic Education for Kagisano*. Second and Third Conference Proceedings. Selebi-Phikwe and Maun, Botswana: Ministry of Education.

Not only has there been concern about consultation, but also performance of students in the program. Curriculum change must be accompanied by examination adjustments and improvements to take into account the professed intentions of the new instructional program. JSEIP has provided extensive assistance and training to the Department of CD&E in this area.

Moahi, S., & Bowers, J. E. (1988, 989, 1990). *Research and Testing Centre Research Notes*. Gaborone, Botswana: RTC (continuing series).

Nitko, A. J. (1989). *New Direction for Educational Testing at the Junior Secondary Level*. Gaborone, Botswana: JSEIP.

Nitko, A. J. (1990). *Implementing Criterion-Referenced Examinations in Botswana: Recommendations for JC Examination Reform*. Gaborone, Botswana: JSEIP.

Sigman, V. A., & Randal, M. (1989). *The World of Educational Innovations*. Gaborone, Botswana: Curriculum Development Unit and JSEIP. (computer simulation game and teaching notes)

Substantive

The JSEI and IEES Projects have collaborated on a number of research activities focused on the classroom during the past five years, when expansion and restructuring particularly at the junior secondary level have been most notable. Ethnographic analyses, questionnaires, and extensive field observations have provided a rich information base for the consideration of educational context and status in the light of dramatic system growth and instructional, structural, and substantive changes. Consultative seminars within the Ministry have supplemented the dissemination of papers and the formal discussions of their implications for instructional policy and practice.

Marope, M. (1989). *Suggested Procedures for Assessing the Educational Needs of Junior Secondary School Leavers Entering Post-JC Training*. Gaborone, Botswana: University of Botswana and JSEIP.

Noel, K. (1989). *Report on Interviews with Teachers Who are Trying Out New English Materials*. Gaborone, Botswana: JSEIP.

Prophet, R.B. (1989) *Pupil-Centered Teaching? Classroom Observations in Junior Secondary Schools*. Gaborone, Botswana: Department of Maths and Science Education, University of Botswana and JSEIP.

Prophet, R.B. (1988) *Rhetoric and Reality in Science Curriculum Development in Botswana*. Gaborone, Botswana: Department of Maths and Science Education, University of Botswana and JSEIP.

Prophet, R. B. and Rowell, P. M. (1988) *The Curriculum Observed*. Gaborone, Botswana: Department of Maths and Science Education, University of Botswana and JSEIP.

Prophet, R. B. and Rowell, P. M. (1988) *Curriculum-in- Action: Classroom Observations in Botswana Junior Secondary Schools 1987-1988*. Gaborone, Botswana: Department of Maths and Science Education, University of Botswana and JSEIP.

Prophet, R. B. (1991) *English in the Junior Secondary School: Case Study of a Curriculum Implementation*. Gaborone, Botswana: University of Botswana and JSEIP.

Snyder, C. W., Jr., & Ramatsui, P. R. (Eds.) (1990). *Curriculum in the Classroom: Context of Change in Botswana's Junior Secondary School Instructional Programme*. Gaborone, Botswana: Macmillan.

IX. SUMMARY OF ACCOMPLISHMENTS DURING THE PROJECT

Educational development in Botswana has been rapid, exciting, and challenging. Within the last few years, new colleges, departments and units within the Ministry have been formed; the numbers of community junior secondary schools have dramatically increased as have the number of headmasters and teachers required to staff those schools; new curicula have been developed and implemented; and other improvements in Botswana's educational infrastructure have taken place. Most importantly, greater numbers of students have been provided access to a full nine years of basic education. With each of these developments has come new perspectives, new needs, new interests, and new initiatives - all directed toward the growth, development, and improvement of education in Botswana.

The Junior Secondary Education Improvement Project (JSEIP) has been privileged to share in and to contribute to Botswana's educational development. Reflecting the many changes that have occurred within the Ministry since the beginning of JSEIP in 1985, JSEIP's contribution has taken many forms. It has provided funds to construct buildings such as those which house the Department of Curriculum Development and Evaluation and teacher education centres and funds to equip those facilities. It has provided equipment and materials to meet the growing demands for locally developed curriculum and teaching materials. Finally, it has helped the Ministry develop and institutionalise the systematic processes required to improve the educational system and to achieve its goals for the junior secondary program. The latter contribution is one of the most important. It has occurred through the provision of numerous long term advisors and short term consultants who have worked closely with their counterparts and other colleagues in a variety of areas within the Ministry. Those areas include curriculum development and testing, inservice teacher training, pre-service teacher training, headmaster training, media production, educational research, curriculum resources, community consultation, and organisational and institutional development.

To paraphrase a statement made in a previous section, our project can never claim credit for change; institutions change themselves. At best, a project like JSEIP can facilitate change by helping to identify and communicate problems to the Ministry, proposing solutions to those problems, and helping the Ministry implement the solutions which it finds acceptable. Through this process, the following project objectives have been accomplished.

1. Curriculum has been revised to include objectives, learning strategies, achievement measures, and instructional materials for the Nine Year Basic Education Programme, especially in English, Art, Social Studies and Design and Technology while support has been provided to all other subject areas.

2. Training and support have been provided to improve organizational information and staff skills to manage the junior secondary system.

3. The Department of Curriculum Development and Evaluation has been strengthened through training and support in continuous assessment and criterion-referenced testing procedures.

4. Preservice teacher education has been strengthened through support of curriculum development, assessment, and practice teaching initiatives and the establishment of a Design and Technology Department within Molepolole College of Education.

5. Inservice teacher education has been strengthened through the training of inservice officers and headmasters, through the provision of materials to help

them understand their jobs more thoroughly, and through the provision of training in teacher "coaching" and action research techniques.

6. A building for Curriculum Development and Evaluation personnel has been constructed to include a production facility and Curriculum Resource Centre which are functioning effectively.

7. Counterparts are in place to officially take over the roles of their JSEIP advisors at the end of the project in the areas of Curriculum Development (Evaluation, Planning, Design and Technology, Art, Resource Centre, Media Production) and Inservice Teacher Training.

X. PLANNING FOR THE FUTURE: Beyond JSEIP

The project has been a complex one having spanned many of the departments within Botswana's Ministry of Education and many areas of development. It has primarily been a catalytic development effort to work with the Ministry to develop and institutionalize systematic processes of curriculum development, teacher education, and planning. Being a catalyst for change rather than the implementer requires time - time to teach and demonstrate how positive change might occur, time to allow the proposed change to be evaluated and accepted, time to put the machinery for change in place, and time for it to happen. Particularly, in the area of curriculum development, the efforts to develop, evaluate, revise, and improve processes and products are continuous and cyclical. At the end of the project, there will still be room for further support in some of the same areas with which JSEIP has been involved. With the Basic Education Consolidation (BEC) Project to begin in 1992, the following recommendations suggest ways in which the Ministry, perhaps with support from BEC, might be able to maintain, build upon, and institutionalize positive changes that have been supported through JSEIP.

A. Curriculum Evaluation and Planning

Curriculum and Assessment. Further training for curriculum development staff on the concepts of criterion-referenced testing and continuous assessment and how they relate to curriculum materials development and student performance assessment.

Policy on Student Assessment. A policy regarding the use of continuous assessment should be developed in order to provide guidance to curriculum developers, teacher trainers, and teachers.

Links between Departments and Units. Efforts to develop effective, two-way communication among all divisions of the Ministry should continue and more formal mechanisms for improving communication and cooperation should be established.

Training and Staff Development. Curriculum Evaluation and Planning staff should be provided with an opportunity to receive long term training in their areas of specialty. In-house training sessions on the various curriculum development processes should continue, with the Curriculum Development Procedures Manual as a major resource. After the Manual has been used for a year or two, it should be revised based on Curriculum Development Officer (CDO) feedback.

Formative Evaluation. Formative evaluation of products being field tested needs to continue. From past experience, time and personnel constraints make it difficult to track all of the various evaluation activities and to process all of the data received. Therefore, it is suggested that a yearly formative evaluation plan be maintained which would include: (1) a prioritized list of materials or programs to be evaluated within the Curriculum Development Unit (CDU); (2) the resources (e.g., funding and personnel time) to be allocated to each evaluation project; (3) allocation of responsibility for the various components of the plan; and (4) a time-line describing the anticipated completion of each project. The plan would serve as a guide which could be revised as dictated by the situation.

Computerized Curriculum Data Base. The Curriculum Data Base will still require input of data in the future, based on syllabus changes and other curriculum factors. Currently, only Curriculum Development Officers are in the position to provide that data. The Data Base will also require additional

refinements as more officers use it in their work. Therefore, if the Curriculum Data Base is to reach its potential, there must be a commitment of Curriculum Development Officers to provide the necessary input, additional training for officers to provide them with the skills to do so, and someone officially appointed to maintain and improve the data base.

Planning. As agreed to by CDU staff, each subject area should develop a five year plan for curriculum development, providing greater planning detail for the first six months of the plan. Also, a long term plan should be developed for the CDU as a whole to guide the Curriculum Planner in determining where additional resources may be required and in identifying and planning staff development opportunities. Because it will be some time before the number of personnel within the Curriculum Development Unit is adequate to handle all of its official responsibilities, the CDOs will need to continue reaching to those outside of the CDU for help in curriculum development. To do so, they will increasingly require project management skills and should be provided with inservice training in this area.

Desk-top Publishing Skills. Since all CDOs have access to computers and produce much of their material through wordprocessing programs, intermittent training on desk-top publishing skills should be provided to develop officer's skills in this area.

B. Curriculum Resource Centre

Continue the systematic expansion of the Resource Centre, considering the capacity of personnel to maintain the resources in the Centre. As the Resource Centre capacity for increasing services allows, begin developing linkages with Education Centres in order to make the Centre's resources more widely available and accessible.

C. Design and Technology

Curriculum Materials. Revise Term 3 and Form 2 materials as a result of the trial process in 1992. Complete textbook to accompany the new Student Workbook and Teacher's Handbook.

JC Exam. Continue test item writing workshops for establishment of an item bank for end-of-year 1 exam and Junior Certificate Examination (JCE) to adhere to criterion-referenced testing (CRT) guidelines. Establish guidelines for practical portion of the JC exam - what type of problem, type of materials to be submitted, evaluation process, etc. Establish a moderation process for continuous assessment marks.

Training. Provide formal training for the Design & Technology CDO in the following areas: content area of Design & Technology, curriculum development, management and organization, writing skills. Continue to work with teachers on CRT and continuous assessment consistency.

Management and Organization. Develop a workable 5-year plan for Design & Technology, established in coordination with the National Panel, Curriculum Planner, and Curriculum Evaluator.

D. Art

CDO Training. Provide long term training for the Art CDO to prepare her for her job.

Continuous Assessment and Criterion-Referenced Tests for the Art Examination. Continue close coordination between the Research and Testing

Centre (RTC), Curriculum Development Unit, Examinations Unit, Department of Secondary Education (DSE), and the Molepolole College of Education (MCE) in the preparation of the Art assessments and junior certificate examinations.

Training. Continue plans for six Molepolole College of Education graduates to attend the Florida State University for long term training in Art education.

E. Testing/Examinations

In-house Data Bases. Continue to evolve RTC creation of in-house databases for subjects similar to that created for Art. The RTC should also look ahead to using the proposed in-house computer capability for developing CRT-based item banks.

Proposed Computer System. Continue to consider the purchase of proposed computer hardware and procurement of the necessary installation, training, and maintenance. Support for the computer system itself as well as training would be particularly important for maintaining a criterion-referenced testing and continuous assessment system.

Criterion-referenced Testing Implementation. The major goal of any student testing and continuous assessment component should be the wider implementation of criterion-referenced test (CRT) methods. In the future, efforts should should be made to elaborate, support, refine, and extend CRT implementation that has been put in place.

F. Inservice Teacher Education

Inservice Teacher Education Officer. Guidance to the new Inservice Teacher Education officer should continue in the following areas:

- planning and management required on the job
- developing a scheme of service for the inservice officers within the new Department of Teacher Education and in accordance with Botswana's National Development Plan 7 priorities
- developing and implementing a staff development plan, building on past staff development work and
- working with inservice Field Education Officers (FEOs) in schools to understand their job responsibilities and to begin to supervise their work.

Note that the BEC "bridging" activities through the extension of JSEIP to April 1992 are designed to address this, in part.

G. Pre-service Teacher Education

- Understaffing within Colleges of Education should be addressed in the future.
- Build upon self-studies and reforms to improve College curricula and pedagogy with special emphasis on improving student assessments and providing students with the skills to use continuous assessment in their teaching
- Continue support for long term training and other professional development opportunities for College staff
- Continue support for the development and use of research skills among College staff.

XI. LESSONS LEARNED AND SUGGESTIONS

The following lessons learned are drawn from an external evaluation of JSEIP completed in August, 1990 (conducted by Multi-Services International, Inc.), from JSEIP Progress Reports, and from the observations of JSEIP team members.

A. Project Scope

- *Educational systems are large and complex.* Education sectors contain many inter-related sub-systems. There are few simple solutions to complex problems within complex systems. Once solutions are identified, they take time to implement and flexibility is required on everyone's part.

  A sector-wide educational project must attend to the various implications of its interventions; this usually involves activity in a number of subsectors of the system; the balance between apparent solutions and their load for other parts of the system is difficult to achieve; projects should have the resources to flexibly react to the implementation effects of the interventions across the sector.

- *Sector assessments consist of political lists of "wants"* carried out in consultation with higher MOE officials; although the political agenda is extremely important, additional consultation is required at the operational levels if the project hopes to avoid resistance and have lasting impact.

- *It is time that another national education commission is convened to plan for the next 10 to 20 years.* Botswana's first National Commission on Education report identified Botswana's educational needs and provided the scope for Botswana/Donor Agency educational development projects such as JSEIP. It has been a vital part of the development that has taken place in Botswana's education system during the past 15 years.

- *Contextual review and analysis should be carried out at the outset of large-scale projects - especially if they are targeted toward sector-wide, inter-departmental development and change.* Attempts should be made to understand the "real" duties of local personnel, perceived training needs, tasks and problems faced in the short-term. Some examination of systems in place should attempt to find out why things are done in a certain way (they "work" in the context and have evolved to deal with contextual problems) and assess what things fit with the project approach. Such information might help to minimize system-trauma, both in terms of the organization and the fit of the intervention in the operational and policy environment. It would also help determine, early on, if the client country has adequate personnel to meet its commitments to the project and to the goals it has set for itself. If not, the project goals should be adjusted accordingly.

  All major participants, not only representative officials, should be involved at some point in the contextual review process. Project team members should play an active role in conducting the contextual review during their first six months in the country. Below are some suggestions for how project advisors and their counterparts might conduct a contextual review. The examples provided are drawn from the area of curriculum but could equally apply to other areas such as teacher education.

Project team members with their counterparts could:

1. Analyze existing documents regarding instructional context and interagency covenants and summarise identified priorities.
2. Reconfirm with project designers (local, donor agency, and contractor) the interagency covenants and priorities.
3. Conduct contextual analyses with local implementers (local curriculum officers of specific subject areas and contractor's technical advisers) to inform, confirm, and/or solicit suggested revisions.
4. Identify expectations, perceived problems/needs and priorities as well as perceived resource limitations/constraints of local curriculum developers, both within and across subject areas.
5. Identify matches and mismatches between perceptions of local implementers and those of their inter-departmental colleagues.
6. With representatives of agencies, local implementers, and their colleagues, resolve discrepancies, revise priorities and covenants.
7. Local implementers and technical advisers provide information about revised project and solicit feedback from colleagues in other units/departments who may be affected by success of implementation.
8. Identify matches and mismatches between perceptions of local implementers and those of their inter-departmental colleagues.
9. With representatives of agencies, local implementers, and other colleagues, resolve discrepancies, revise priorities and covenants.
10. Based upon both the system-wide and subject-specific priorities and the feedback gained through consultation, keep, adjust, adapt or develop new project plans for priority areas. The level for which these plans are targeted will vary. Some may be at a system-wide level (e.g., begin with a needs assessment of post-JC training needs, plan for a change in Ministry policy, etc.). Others may be at a sub-sector level across all subject areas (e.g., conduct formative evaluation for all newly developed materials, develop a test blueprint for all subject examinations, etc.). Still others may be within specific subject areas (e.g., produce teacher's handbooks for Agriculture).

The net result of such an activity should inform project advisors of what their working environment will be, inform local officials of what the project is about, provide a systematic way of updating and revising the project goals and plans, establish communication links, establish working relationships between advisors and their counterparts, and provide a sector-wide awareness and, perhaps, greater acceptance of the project's goals, activities, and products.

B. Project Administration and Management

- *The role of project coordinator or chief of party is a full time job. This is particularly true in large-scale projects with several long term advisors and numerous short term consultants who are operating in several departments.* In addition to managing the project, the chief of party should have the time to visit with Ministry officials, USAID officials, and his own project staff to understand what is going on and what can be done to support various activities.
- *Preferably, a project should have one agreed-upon "master" in terms of meeting contractual obligations.* Potentially there can be many masters including the client government, the local USAID mission, the USAID Washington office, the institutional contractor, and probably others that have not even been thought of. All stakeholders should certainly be informed about the project and consulted on a regular basis; however, in terms of formal reports and requests, there should be a minimum of confusion as to who the responsible recipient should be and

who calls the shots. Less than that can result in misunderstandings for all involved.

- *There is considerable sensitivity about change and who controls it.* Local authorities and professionals want to "own" the change so projects cannot impose top-down interventions without encountering considerable resistance and even hostility. The presence and influence of the project serves as a catalyst to change. The project can enhance its influence by being persuasive rather than rigid "logframe implementers"; logframes are rarely developed in association with the target stakeholders and lines of authority and approval are rarely clearly articulated before the project starts to operate.

- *Projects take more time than they do.* Impacts take a great deal of time, more time than a project has. With pressure from project managers to "produce" according to a logframe, there is a tendency to take shortcuts to achievements by "doing" rather than "developing." Projects should proceed on the right track and accomplish credibility rather than empty products that approach unrealistic promises (e.g., education can't create jobs).

- *Most logframes specify indicators in terms more conducive to project acceptance and appearance than reality.* Few projects can have the impact claimed; the indicators tend to highlight system impact.

  Projects, on the other hand, tend to have localized impact or contribute to on-going modernization as part of other influences. The objectives should be the focus rather than the predetermined indicators and inappropriate indicators of those objectives should be questioned.

- *Reporting should be minimized to that which is actually used in project management or project marketing*; well designed reports are more likely to be read and used.

C. Instructional Systems Design (ISD) and Curriculum Development

- *Of all of the products that result from an ISD process, performance objectives (four component types) are the most critical in the development of a valid, effective curriculum.* They are communication devices and public contracts that tell others what students should know at the end of schooling. They are the foundation upon which teaching, learning materials, and tests should be based. Vague objectives lead to many interpretations of what should be taught and how it should be taught.

- *Criterion-referenced tests are fundamental to understanding what teachers have taught, what students have learned, and how learning can be improved.* In addition to assessment devices, they are communication devices like objectives. In a centralized examination system, they provide the standard by which teachers teach and the standard by which students are expected to perform. The results of student performance on criterion-referenced examinations can be meaningfully compared to those of other years and they provide the basis for meaningful reports to students, teachers, parents, and policy makers.

- *Either an holistic or an "opportunistic" approach can be taken when using ISD methods in curriculum development.*

  - An holistic approach is what most text books talk about and is based on the assumption that everyone in the system will use an ISD approach. However, for an ISD approach to be successfully implemented system-wide, a number of things are required. The system should be a relatively

closed system; that is, one which is not dependent upon those outside of the system to successfully develop or implement the curriculum. Other requirements are that the system is mandated to use an ISD approach from beginning to end, has the personnel who understand or have the time to to learn, evaluate, and accept the ISD approach, and has the resources to carry-out the approach. Relatively closed systems like businesses and industries and the military often meet these requirements. Relatively open systems like state educational organisations often don't.

- An opportunistic approach is one which works within the context of the system and operates within various sub-sections of the system when the opportunity arises. The short term strategy of this approach is (a) to create an awareness, understanding, and appreciation within the system of the value of components of the ISD approach and (b) to look for opportunities to demonstrate how the components of the process can be productively used. The best opportunities rest with people who have an immediate problem to solve and want some help solving it (e.g., curriculum officers). The long term strategy would be to parlay institutional awareness into increased use and acceptance of various ISD components (e.g., criterion-referenced tests or formative evaluation) and, ultimately, the institutionalization of those approaches. The characteristics of an opportunistic strategy might include the following:

1 identifying the perceived needs of individual curriculum developers in addressing the curriculum development problems at hand;
2 helping them address those problems systematically, using relevant instructional systems development procedures;
3 capitalizing upon successes within one subject area by holding them up as good examples for other officers to use as potential models;
4 once success has been demonstrated, establishing policy which ensures that future curriculum development efforts in all subject areas are conducted in the same relatively systematic fashion; and
5 documenting that policy in the form of a curriculum development policy manual.

- *Formative evaluation is a most useful ISD process but the process needs to be adapted to the resource constraints of a system.* Formatively evaluating curriculum materials during their development is probably most cost-effective in the long run; but in the short-run, it has the appearance of being expensive, time-consuming, and resource-intensive. Someone should re-evaluate the process within the context of developing countries where the lack of trained personnel, transport, distance, and other factors may limit formative evaluation efforts.

- *Of the ISD model for curriculum development, needs assessment and dissemination and diffusion processes are the most neglected because they deal with communication processes, not concrete products* (e.g., producing a syllabus). In situations where thre are constraints in time, resources, and personnel, those involved will go for the product (e.g., produce a book) every time, leaving the communication processes to chance. This understandable choice may lead to rejection or at least criticism by those who were not consulted.

So, if developers are more interested in working on products rather than the process of ensuring their acceptance, what can be done to ensure the products are used by the target population? It seems that, with some adaptation, the formative

evaluation component of ISD might provide a solution. That component requires communication and consultative processes to solicit feedback from the target population within the context of evaluating and improving specific products. If formative evaluation were designed carefully, one could improve the chances of having the product accepted while undertaking the task of improving its effectiveness.

- A *systematic approach to developing curriculum will only be partially realized in centralised educational system until a single component of that system is vested with the authority to make final decisions about the curriculum, both in policy and in practice.* Part of the central authority's responsibility would be to plan curriculum changes well in advance and to communicate anticipated changes and progress, on a regular and meaningful basis, to those who are responsible for implementing the curriculum.

D. Project Implementation

- *Communication links across and between relevant instructional sub-systems is vital.* Often, the introduction of a large-scale project exacerbates the communication problems that already exist in an educational system. Three useful methods used during the project to help the Ministry establish practical and important communication links were:

  - at the national level, a series of National Community Consultative Conferences on the curriculum. These occurred three times in a period of two years at three geographically distinct locations in the country and involved community representatives from most walks of life;

  - at the Ministry level, a Curriculum Coordinating Steering Committee which was comprised of representatives from each Ministry of Education department that might be affected by changes in the curriculum and which was convened monthly to discuss and make recommendations regarding curriculum. Minutes from each meeting would have attached workshop schedules from every MOE department and unit and were distributed nationally to educators (e.g., officers, headmasters); and

  - reference groups. Members of reference groups were stakeholders in the areas being focussed on. They would work with consultants as a consultative group and would provide consultants with terms of reference, advice, information, and feedback.

- *There are ambiguities within complex organizations in terms of areas of responsibility.* These should be explicated at the outset of the project and, to a degree, throughout the project. They are often created because of changes that have occurred during the process of development and must be attended to before they paralyse project activities and focus unwanted attention on the project.

- *The activities and (possibly) expertise involved in materials production is different from that required for institution building.* Decisions need to be made early and publicly so that there is commitment to and scheduling for whichever effort is required of the project.

- *If a project's focus is on production, then training must be organized independently of the production process or it will get limited attention.* That is, an advisor who is expected to produce a textbook is unlikely to have the time to teach others the process of developing a textbook; an advisor who is expected to train counterparts the processes of developing textbooks should not be expected to produce a textbook in the same timeframe.

- *A project plan should not prescribe the conditions of long term training until the educational needs of counterparts have been identified.* Otherwise, the project's capability to address the needs of the system and to provide appropriate training may be inhibited. Degree work should be equally available to counterparts who have only diplomas and those who already have more advanced degrees but who require more education to do their jobs.

E. Project Research

- *A first research step in a project should be the collection of information about existing organisational structures, goals, processes, products, and needs.* There is usually very little information available that is useful for the implementation of a project; project documents cover larger substantive issues, but are not sufficiently detailed, contextually relevant, or accurate for project work.

- *Treating the intervention as a "constant" independent variable, particularly in an evolving, developing system, can lead to misunderstandings.* Analyses and formative evaluations of interventions must attend to "what is the intervention" in each context and across time. If experimental paradigms are employed, then the context must be circumscribed, but this, in turn, limits the validity of the "experiment" when "going to scale." Coupling "deep descriptions" with "trials" may be the way to anticipate problems and identify successes; "good" description is a good way to start.

- *We learn so little from cumulative projects because there is no reflection on why things worked and didn't work.* External evaluators don't have the time or detailed contextual knowledge to fully reverse the loss. Most people seem to feel that local conditions prevail and override generalized considerations. Unless the project is reflective, chances are the linkages between activities and outcomes will be weak and unsustainable. Additionally, unless those reflections are documented, valuable information of what worked and did not work in the project will not be available to guide the work of future projects.

- *Local solutions based on local research are more likely to be accepted than "imported" solutions.* Research also establishes contacts with the intended stakeholders and those contacts should be more "listening" rather than "telling."

- *Research provides a common base for further discussion about change and the problems associated with change.* Consultation with a broad spectrum of the education system about project relevant research will improve the research and its likely impact. This needs to happen more than once, at various levels of the system, and in different contexts to maximize the effect.

- *A project should leave a publication trail for future efforts in the area.* Good work and information should be documented in lasting form. There is good evidence that education has changed substantially over the years and yet we revisit reforms almost periodically. Since reforms emerge from value conflicts in influential constituencies, it is useful to document encounters with each movement, as represented by the particular project "mythology," so that future engagements are well informed. Research can also alter attitudes about reforms and therefore enters the change equation itself.

- *Decision makers and developers seem to pay particular attention to comparative information.* Project research should take this into account and provide a mechanism for cross-cultural, cross-national research.

- *Professional development among project advisors should be encouraged in terms of conducting and reporting empirically-based research findings.* While

this should not be a mandatory activity, the project should provide incentives for advisors and their counterparts to develop research reports. One incentive would be project support for advisors and counterparts to attend international research forums to present their findings. Furthermore, long term project advisors should be given project support to attend at least one professional conference every two to three years so they can stay current with developments in their fields.

XII. Lists: JSEIP Personnel & Counterparts, Trainees, Reports & Publications (1985 - 1991)

A. JSEIP Advisors/Counterparts and Consultants

Long-term Advisors and their Counterparts

1. D. Allen (Molepolole College of Education)
2. J. Bowers (Testing and Measurement) - **Counterparts: S. Moahi & K. Letshabo**
3. D. DuBey (Teacher Inservice)
4. A. Hartwell (Education Planning and Chief of Party - 1985 - 1989)
5. L. Ives (Art Curriculum) - **Counterpart: E. Baakile**
6. W. LeBlanc (English Curriculum)
7. J. Lunstrum (Social Studies Curriculum)
8. J. McDonald (Headmaster Inservice)
9. C. Miles (Curriculum Resource Centre)
10. D. Mullaney (Teacher Inservice) - **Counterpart: K. Motlotle**
11. K. Noel (Curriculum Planning and Evaluation and Chief of Party - 1990 - 1991) - **Counterparts: P. Moanakwena (Planning) & N. Koolese (Evaluation)**
12. J. Odharo (Molepolole College of Education)
13. J. Robb (Design & Technology Curriculum) - **Counterpart: T. Peleowestse**
14. W. Snyder (Programme Evaluation and Chief of Party - 1989 - 1990)
15. B. Vogeli (Media Production) - **Counterpart: D. Ratsatsi**
16. F. Walton (Molepolole College of Education)

Short-term Consultants

Department of Curriculum Development and Evaluation

17. P. Allen (Organisation and Policy)
18. R. Allen (Social Studies)
19. J. Barth (Social Studies)
20. C. Berquist (Evaluation)
21. C. Burkman (Curriculum Development)
22. J. Carter (English Curriculum)
23. R. Davis (English Research)
24. W. Dick (Formative Evaluation)
25. J. Draper (Art Education)
26. J. DuPlessis (Curriculum Data Base)
27. T. Gonzales (Art Education)
28. L. Ives (Art Education)
29. W. LeBlanc (English Curriculum)
30. D. Herschbach (Design & Technology Curriculum)
31. Z. Mapp-Robinson (Guidance and Counselling)
32. D. Mkandawire (Guidance and Counselling)
33. M. Merryfield (Social Studies Curriculum)
34. J. Meyer (Organisational Research)
35. J. Nagel (Organisational Research)
36. A. Nitko (Testing and Measurement)
37. A. Quarmby (Video-based Education Research)
38. D. Redfield (Science Curriculum)
39. J. Robb (Design & Technology Curriculum)
40. S. Rollin (Guidance and Counselling)
41. P. Rowell (Educational Research)
42. A. Schleicher (Testing and Measurement)
43. V. Sigman (Agriculture Curriculum)
44. P. Süth (Needs Assessment Research)

Department of Teacher Education

45. M. Driscoll (Continuous Assessment and Action Research)
46. A. Oosterhof (Continuous Assessment)

University

47. H. Williams (University of Botswana)
48. S. Grant (Florida State University - Batswana Graduate Studies)

Molepolole College of Education

49. G. Marks
50. R. Hoffman
51. M. Morgan
52. R. Clarken

B. JSEIP Sponsored Trainees and Their Current Positions

MASTERS DEGREE

Florida State University

1.	M. Babitseng	Kopong CJSS (Headmaster)
2.	L. Bantsi	Parwe CJSS (Headmistress
3.	S. Basiamang	Molefe Secondary School (Headmaster)
4.	D. Batshoghile	Oodima CJSS (Deputy Headmistress)
5.	J. Chengeta	Curriculum Development Unit (Agriculture Curriculum Development Officer)
6.	G. Gobotswang	Molepolole College of Education (Lecturer)
7.	K. Jeremiah	Molepolole College of Education (Lecturer)
8.	R. Jorosi	Pelaelo CJSS
9.	T. Letsogile	Tutume Teacher Training College (Tutor)
10.	N. Losike	IDM (Lecturer)
11.	I. Lubinda	Secondary Department (Social Studies Senior Education Officer)
12.	M. Maphanyane	Botswana Railways (Gaborone)
13.	A. Maphorisa	Maru-a-pula Secondary School (Teacher)
14.	M. Masisi	Curriculum Development Unit (Social Studies- Curriculum Development Officer)
15.	S. Moahi	Research and Testing Centre (Senior Research Testing Officer)
16.	L. Molefi	Molepolole College of Education (Lecturer - Social Studies)
17.	M. Nyati	Senior Guidance and Counselling Officer
18.	D. Ramatsui	Serowe Teacher Training College (Tutor)
19.	P. Richard	Curriculum Development Unit (Social Studies Curriculum Development Officer)
20.	S. Tambula	Tutume Secondary School (Headmaster)
21.	O. Tselayakgosi	Ntebogang CJSS (Deputy Headmaster)
22.	M. Tshukudu	Tonota College of Education (Home Economics Lecturer)

Ohio University

23.	J. Maphorisa	Principal Guidance and Counselling Officer

University of Wisconsin at Madison

24.	A. Besson	Tonota College of Education (Lecturer)
25.	M. Martin	Secondary Education Department (Senior Education Officer)
26.	M. Sebogodi	Molepolole College of Education (Lecturer)

Southern Illinois University at Edwardsville

27.	D. Ratsatsi	Curriculum Development Unit (Media Production Section Officer and Section Head)

POST MASTERS WORK

Florida State Universtiy

1.	Rosemary Ford	Tonota College of Education (Lecturer)

SHORT TERM TRAINING

University of Pittsburgh

1.	B. Chilisa	University of Botswana (Lecturer)
2.	N. Koolese	Curriculum Development Unit (Curriculum Evaluation Officer)
3.	K. Letshabo	Research and Testing Centre (Research and Testing Officer)
4.	S. Moahi	Research and Teasting Centre (Senior Research and Testing Officer)

Xeratech Training Centre

1.	M. Ntebolang	Curriculum Development Unit (Production Section Staff Member)
2.	M. Segobaetso	Curriculum Development Unit (Production Section Staff Member)

C. JSEIP Publications, Papers and Reports

Below are listed publications, papers, and reports generated by the Junior Secondary Education Improvement Project. At the end of each entry is an abbreviation that indicates where a copy could most likely be located. The locations are abbreviated as follows:

CDE	Department of Curriculum Development and Evaluation
DSE	Department of Secondary Education
DTE	Department of Teacher Education
FSU	Florida State University
MCE	Molepolole College of Education
UB	University of Botswana
USAID/B	United States Agency for International Development/Botswana

1. Allen, Dwight W. and Marks, Geoffry W. (1989) *Molepolole College of Education, Staff Development Report: Survey Results and Recommendation.* Molepolole, Botswana: JSEIP. (MCE)

2. Allen, Pamela. (1989) *Travel Report for Consultancy to USAID/JSEIP in Botswana, October 11-November 1, 1989.* Tallahassee, Florida: JSEIP. (FSU)

3. Allen, Pamela. (1989) *Policies Guiding the Department of Curriculum Development and Evaluation.* Gaborone, Botswana: JSEIP. (CDE, FSU)

4. Allen, Rod. (1989) *Ecoplay: A Game of Environmental Feelings.* Tallahassee, Florida: FSU and JSEIP. (CDE, FSU)

5. Allen, Rod. (1989) *The Botswana Cattle Trek Game from Gantsi to Lobatse, Teacher's Guide.* Tallahassee, Florida: FSU and JSEIP. (CDE, FSU)

6. Ashwell, Mike A. and Walton, Frank. (1988) *Curriculum Development for Technical Studies, Proposed First Year Program.* Molepolole, Botswana: MCE and JSEIP. (MCE, CDE, FSU)

7. Babitseng, Moemedi and Allen Rodney F. (1989) *Foreign Economic Aid Game.* Tallahassee, Florida: FSU and JSEIP. (CDE, FSU)

8. Barth, James. (1989) *Botswana Social Studies Teaching Methods Handbook.* (Trial edition edited by K. Noel) Gaborone, Botswana: CDE and JSEIP. (CDE, MCE, FSU)

9. Barth, James L. (1989) *Final Report on Consultancy: Social Studies Materials Development, 3 June - 8 August 1989.* Gaborone, Botswana: JSEIP. (CDE, FSU)

10. Bowers, John. (1988) *Materials Prepared for the Molepolole College of Education Department - Assessment.* Molepolole, Botswana: MCE and JSEIP. (MCE, CDE, FSU)

11. Bowers, John. (1988) *Materials Prepared Molepolole College of Education Teaching Practice.* Molepolole, Botswana: MCE and JSEIP. (MCE, CDE, FSU)

12. Bowers, John. (1986) *Workshop outline on Writing Test Questions, Botswana.* Gaborone, Botswana: JSEIP. (CDE, FSU)

13. Burkman, Ernest. (1991) *CDU Curriculum Development Procedures Handbook.* (Trial edition edited by K. Noel, J. Robb, & P. Moanakwena) Gaborone, Botswana: CDU and JSEIP. (CDE, FSU)

14. Burkman, Ernest. (1989) *Final Report of Science Curriculum Development Consultancy Conducted During May-June 1989.* Tallahassee, Florida: JSEIP (CDE, FSU)

15. Burkman, Ernest. (1987) *Some Thoughts Regarding a 1-9 Science Program for Botswana.* Gaborone, Botswana: JSEIP. (CDE, FSU)

16. Burkman, Ernest. (1987) *Some Issues in Designing a "Practical Science" Curriculum.* (CDE, FSU)

17. Burkman, Ernest. (1990) *Suggested Guidelines for Syllabus Development and Formative Evaluation.* Gaborone, Botswana; JSEIP. (CDE, FSU)

18. Clarken, Rodney H. and O'mara, Felix R. (1987) *Social Studies in Botswana.* Paper presented at the Annual Meeting of the Botswana Educational Research Association, Gaborone, Botswana, November 20-21, 1987. Molepolole, Botswana: MCE and JSEIP. (MCE, CDE, FSU)

19. Clarken, Rodney H. (1987) *Eliminating Prejudice Through Social Studies.* Paper Presented at the Annual Meeting of the Botswana Educational Research Association, Gaborone, Botswana, November 20-21, 1987. Molepolole, Botswana: MCE and JSEIP. (MCE, CDE, FSU)

20. Cownie, David. (1988) *Classroom Observation Project Summary Report, August 1988.* Conducted by Social Impact Assessment and Policy Analysis Corporation, Gaborone. Gaborone, Botswana: JSEIP. (CDE, FSU)

21. Cownie, David & Ives, Laura. (1990) *Art Education and Art Employment Research Survey.* Gaborone, Botswana: SIAPAC and JSEIP. (CDE, FSU)

22. Davids, William. (1988) *Educational Program Evaluation Guidelines for Botswana, 1988 Edition.* Gaborone, Botswana: CDE (CDE)

23. Davis, Rosemary. (1987) *Reading Comprehension Study* Gaborone, Botswana: JSEIP. (CDE, FSU)

24. Davis, Rosemary. (1987) *Reading with Understanding, Guidelines for Teachers.* Gaborone, Botswana: JSEIP. (CDE, FSU)

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26. Dubey, Darrell. (1986) *Social Studies: Its Objectives and Some Strategies to Achieve Them.* Gaborone, Botswana: JSEIP. (CDE, FSU)

27. DuPlessis, Joy. (1991) *Final Report on The Botswana Nine Year Basic Education Computerized Curriculum Database.* Gaborone, Botswana: JSEIP. (CDE, FSU)

28. Examinations Unit, Department of Curriculum Development and Evaluation, Ministry of Education, *1992 Art Calendar.* (1991). Gaborone, Botswana: Examinations Unit and JSEIP. (CDE, FSU)

29. Grant, Sydney R. (1990) *Trip Report-Botswana, Assessment of Participant Training, February 9-25, 1990.* Tallahassee, Florida: JSEIP (FSU)

30. Hoffman, Alan. *Test Scoring System User's Manual, Molepolole College of Education Microcomputer Lab.* Molepolole, Botswana: JSEIP. (MCE, CDE)

31. Ives, Laura. *Art: A Curriculum for the Junior Secondary Schools of Botswana.* Gaborone, Botswana: CDU and JSEIP. (CDE, FSU)

32. Ives, Laura. *Development of Junior Certificate Examination in Art.* Gaborone, Botswana: CDE and JSEIP. (CDE, FSU)

33. JSEIP Semi-Annual Progress Reports (1986 - 1991). Compiled by JSEIP Contract Team. Gaborone, Botswana: JSEIP. (USAID/B, FSU)

34. Khama, Seodi and Snyder, Wes. (1986) *Evaluation Task Force Tasks and Procedures.* Gaborone, Botswana: JSEIP and CDE. (CDE, FSU)

35. Lelliot, Tony and Allen, Dwight W. (1987) *Summary of Microteaching Clinic at Molepolole College of Education.* Molepolole, Botswana: JSEIP and MCE. (MCE, CDE, FSU)

36. Lundstrum, John P. (1990) *Progress Report on Social Studies in the Junior Secondary School.* Gaborone, Botswana: JSEIP. (CDE, FSU)

37. Marks, Geoffry. (1987) *The Chalkboard: A Primer on Effective Chalkboard Use* Molepolole, Botswana: JSEIP and MCE. (MCE, CDE, FSU)

38. Marope, Mmantsetsa P.T. (1987) *Suggested Procedures for Assessing the Educational Needs of Junior Secondary School Leavers Entering Post-JC Training.* University of Botswana, Educational Foundations Department, Gaborone: JSEIP. (CDE, FSU)

39. McDonald, Joseph P., Grisdale, Walter and Smith, Mark A. (1985) *Evaluation Report of Workshop for Newly Appointed Headmasters and Mistresses of Community Junior Secondary Schools.* (Conducted at the Institute of Development Management, Gaborone, Botswana, November 18-22, 1985) Gaborone, Botswana: DSE and JSEIP. (DSE, CDE, FSU)

40. McDonald, Joseph P., Grisdale, Walter and Smith, Mark A. (1985) *Evaluation Report of the Headmaster' Workshop.* (Conducted at BRIDEC, Gaborone, Botswana, August 25-30, 1985). Gaborone, Botswana: DSE and JSEIP. (DSE, CDE, FSU)

41. McDonald, Joseph P. and Grisdale, Walter. (1989) *Secondary School Headmaster's Manual.* Gaborone, Botswana: DSE and JSEIP. (DSE, CDE, FSU)

42. Merryfield, Merry M. (1987) *Final Report on Consultancy, Social Studies Materials Development, 17 October - 28 November 1987.* Gaborone, Botswana: JSEIP. (CDE, FSU)

43. Meyer, John W. (1990) *Community Concerns: Public Expectations and Educational Development in Botswana.* Gaborone, Botswana: JSEIP. (CDE. FSU)

44. Meyer, John W. and Nagel, Joane. (1989) *Policy and Organization in Curriculum Development in Botswana.* Gaborone, Botswana: JSEIP. (CDE, FSU)

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46. Moahi, Serara and Bowers, John. (1988) *A Comparison of T-Scores and Normalized T-Scores for Reporting Performance on the 1987 Setswana PSLE, Research Note 88-01.* Gaborone, Botswana: JSEIP. (CDE, FSU)

47. Moahi, Serara and Bowers, John. (1988) *Comparing T-Scores and Normalized T/N-Scores for Paper 2 of the 1987 Mathematics PSLE, Research Note 88-02.* Gaborone, Botswana: JSEIP. (CDE, FSU)

48. Moahi, Serara and Bowers, John. (1988) *A Statistical Analysis of the 1987 Two-Year Social Studies Junior Certificate Examination, Research Note 88-03.* Gaborone, Botswana: JSEIP. (CDE, FSU)

49. Moahi, Serara and Bowers, John. (1988) *An Analysis of Results for the 1987 Two-Year Junior Certificate Examination in Art, Research Note 88-04.* Gaborone, Botswana: JSEIP. (CDE, FSU)

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51. Moahi, Serara and Bowers, John. (1988) *1987 Two-Year JC Multiple-Choice Item and Total Score Statistics, Research Note 88-06.* Gaborone, Botswana: JSEIP. (CDE, FSU)

52. Moahi, Serara and Bowers, John. (1988) *Combining JC Within-Subject Scores: Nominal and Effective Weighting, Research Note 88-07.* Gaborone, Botswana: JSEIP. (CDE, FSU)

53. Moahi, Serara and Bowers, John. (1988) *JCE Overall Merit Ratings Determined from the Average of Seven Subject Standard Scores, Research Note 88-08.* Gaborone, Botswana: JSEIP. (CDE, FSU)

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55. Moahi, Serara and Bowers, John. (1988) *Analysis of the 1987 Two-Year JCE at the School Mean Level: Research Note 88-10.* Gaborone, Botswana: JSEIP. (CDE, FSU)

56. Moahi, Serara and Bowers, John. (1989) *A Comparison of Overall JCE Marks for 1987 and 1988, Research Note 89-01.* Gaborone, Botswana: JSEIP. (CDE, FSU)

57. Moahi, Serara and Bowers, John. (1989) *Assigning Letter Marks for JCE Subject Examinations, Research Note 89-02.* Gaborone, Botswana: JSEIP. (CDE, FSU)

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60. Moahi, Serara and Bowers, John. (1989) *Relationships Among School-Level Mean Scores for IEA Tests and Junior Certificate Examinations, Research Note 89-05.* Gaborone, Botswana: JSEIP. (CDE, FSU)

61. Moahi, Serara and Bowers, John. (1989) *1988 JCE Total Raw Scores on Six Core Subjects for Secondary Schools, Research Note 89-06.* Gaborone, Botswana: JSEIP. (CDE, FSU)

62. Moahi, Serara and Bowers, John. (1989) *The Botswana Sampling Plan for the IEA Reading Project, Research Note 89-07.* Gaborone, Botswana: JSEIP. (CDE, FSU)

63. Moahi, Serara and Bowers, John. (1989) *The Calculation of T-Scores and Marks for Private Candidates, Research Note 89-08.* Gaborone, Botswana: JSEIP. (CDE, FSU)

64. Molutsi, P. P. (1989) *Strengthening Local Education Capacity through Community Involvement.* Gaborone, Botswana: University of Botswana and IEES. (CDE, FSU)

65. Morgan, Michael. (1988) *A Handbook of Resource Materials for a Course in Communication and Study Skills at Molepolole College of Education.* Molepolole, Botswana: JSEIP. (MCE, CDE, FSU)

66. Nagel, Joane. (1990) *Organizational Issues in Curriculum Development in Botswana: A Follow-Up Report.* Gaborone, Botswana: JSEIP. (CDE, FSU)

67. Nitko, Tony J. (1990) *Implementing Criterion-Reference Examinations in Botswana: Recommendations for JC Examination Reform.* Gaborone, Botswana: JSEIP (CDE, FSU)

68. Nitko, Tony.J. (1989) *New Directions for Educational Testing at the Junior Secondary Level.* Gaborone, Botswana: JSEIP. (CDE, FSU)

69. Noel, Kent L. (1991). An application of an ISD approach to curriculum development and change in a large-scale educational project: The case of Botswana. (Paper presented to the annual American Educational Research Association Conference, Chicago, Illinois, April, 1991.)

70. Noel, Kent. (1990) *BIAC Workshop, July 2-5, 1990, Summary Report.* Gaborone, Botswana: JSEIP. (CDE, FSU)

71. Noel, Kent. (1989) *Formative Evaluation Plan - Science (Draft).* Gaborone, Botswana: JSEIP. (CDE, FSU)

72. Noel, Kent L. (1988) *Formative Evaluation Report, Junior Secondary Social Studies Teacher's Guide - Part 2.* Gaborone, Botswana: JSEIP. (CDE, FSU)

73. Noel, Kent L. *Instructional systems development and curriculum change in Botswana* (in press). Journal of Educational Technology Research and Development, 39(3), 1991.

74. Noel, Kent. (1988) *Recommendations about a Teaching Methods Handbook.* Gaborone, Botswana: JSEIP. (CDE, FSU)

75. Noel, Kent. (Editor, 1988 and 1989) *Therisano Ka Thuto: Community Consultation on Basic Education for Kagisano.* Second and Third Conference Proceedings. Selebi-Phikwe and Maun, Botswana: Ministry of Education and JSEIP. (CDE, FSU)

76. Odharo, Johnson. (1988) *Introduction to Instructional Design: A self-instructional modular course on planning, developing, delivering, evaluating and revising instruction.* Molepolole, Botswana: JSEIP. (MCE, CDE, FSU)

77. Odharo, Johnson. (1991) *Curriculum Standardisation: Tour of Zimbabwean Colleges of Education.* Gaborone, Botswana: MCE and JSEIP. (MCE, CDE, FSU)

78. Odharo, Johnson. (1991) *End of Project Summary Report including Molepolole College of Education Foundations of Education Department Programme of Studies.* Gaborone, Botswana: MCE and JSEIP. (MCE, USAID/B, FSU)

79. Prophet, Robert. (1989) *Pupil-Centered Teaching? Classroom Observations in Junior Secondary Schools.* Gaborone, Botswana: Department of Maths and Science Education, University of Botswana and JSEIP. (UB, CDE, FSU)

80. Prophet, Robert. (1988) *Rhetoric and Reality in Science Curriculum Development in Botswana.* Gaborone, Botswana: Department of Maths and Science Education, University of Botswana and JSEIP. (UB, CDE, FSU)

81. Prophet, Robert B. and Rowell, Patricia M. (1988) *The Curriculum Observed.* Gaborone, Botswana: Department of Maths and Science Education, University of Botswana and JSEIP. (UB, CDE, FSU)

82. Prophet, Robert B. and Rowell, Patricia M. (1988) *Curriculum-in- Action: Classroom Observations in Botswana Junior Secondary Schools 1987-1988.* Gaborone, Botswana: Department of Maths and Science Education, University of Botswana and JSEIP. (UB, CDE, FSU)

83. Prophet, Robert B. (1991) *English in the Junior Secondary School: Case Study of a Curriculum Implementation.* Gaborone, Botswana: University of Botswana and JSEIP. (CDE, FSU)

84. Randal, Mike. (1989) *The Research and Testing Center's Computing Capability and Requirements.* Gaborone, Botswana: JSEIP. (CDE, FSU)

85. Redfield, David D. (1989) *Consultant Report, Junior Secondary Science Curriculum Development Workshop and Follow-Up Planning (January 14-24, 1989).* Gaborone, Botswana: JSEIP. (CDE, FSU)

86. Robb, Janet. (1988) *Consultancy for Technical Studies, Preliminary Report.* Gaborone, Botswana: JSEIP. (CDE, FSU)

87. Robb, Janet. (1991) *Design & Technology Final Report* . Gaborone, Botswana: JSEIP. (CDE, FSU)

88. Robb, Janet. (1991) *Design & Technology Curriculum Materials.* Gaborone, Botswana: CDU and JSEIP. (CDE, FSU)

89. Robb, Janet. (1990) *Design & Technology: A Curriculum for the Community Junior Secondary Schools of Botswana.* African Regional Workshop on Technology Education, Nairobi, Kenya. Gaborone, Botswana: JSEIP. (CDE, FSU)

90. Robb, J.L., Peloewestse, T.M. & Walton, F.C. (1990). *Practical Curriculum for Emerging Technology.* Chapter in Curriculum in the Classroom: Context of Change in Botswana's Junior Secondary School Instructional Programme. Snyder, C.W. & Ramatsui, P.T. (Editors). Gaborone, Botswana: Macmillan Botswana Publishers. (All MOE Departments and FSU)

91. Robb, Janet. (1991) *Technology Education in Botswana.* International Technology Education Association Conference, Salt Lake City, Utah. March 17-21, 1991. Gaborone, Botswana: JSEIP. (CDE, FSU)

92. Rollin, Stephen. A. (1990) Guidance and Counselling Training of Guidance Practitioners. Gaborone, Botswana: JSEIP. (CDE, FSU)

93. Sigman, Vickie A. (1989) *CDU Workshop on Dissemination of Educational Innovations, Background Readings.* Gaborone, Botswana: JSEIP. (CDE, FSU)

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95. Snyder, Conrad Wesley, Jr. (1990) *Affective Context of Schools as Potential Indicator of Receptivity to Instructional Change and Teacher Worklife in Botswana.* In D.W. Chapman & C.A. Carrier (Eds.), *Improving Educational Quality: A Global Perspective.* New York: Greenwood Press. (CDE, FSU)

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D. JSEIP Final Reports & Products Submitted with This Report under Separate Cover

1. Design & Technology Final Report and Curriculum Materials
2. Design & Technology Curriculum Materials
3. Resource Centre Book Collection Catalogue/Inventory
4. Resource Centre - samples of computer-generated Resource Centre book collection reports
5. JSEIP Advisory Committee Meeting Minutes (11 November, 1991)
6. Johnson Odharo's End of Project Summary Report
7. Curriculum Standardisation Tour Report
8. Final Report on The Botswana Nine Year Basic Education Computerized Curriculum Database
9. JSEIP Commodity Report (30 November, 1991)
10. Examiniations Unit 1992 Art Calendar
11. Art: A Curriculum for the Junior Secondary Schools of Botswana